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Effects of communication on cognitive and behavioral consistency

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by

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Chapter 1

INTRODUCTION

In a most general sense, this thesis concerns how individuals organize their ideas, emotions and behaviors about a psychological object or issue. More specifically, it investigates how individuals use communication in realigning their patterns of organization about a social issue.

One goal of the investigation is to make a contribution in understanding how individuals use communication messages. Thus, the focus will be upon responses receivers make to messages and not the process by which it is possible for individuals to communicate between each other. The central questions investigated are whether or not there is an observable "drive" toward homogeneity among cognitive and behavioral aspects of an individual's response to an issue and whether or not communication stimuli affect the predictability of actions individuals take toward a social issue.

The investigation draws heavily upon the notions of cognitive consistency theories as they have developed over the last 25 years. However, unlike most other applications of these theories, this study does not involve a laboratory experiment. Rather the processes suggested in the theoretical positions, and generally supported in laboratory experiments, will be observed in a more natural setting.

The procedure followed will be to briefly review some basic assumptions about human behavior including the basic tenets of cognitive consistency theories. This will provide a background from which a more detailed framework will be presented to facilitate studying the problem

posed in this thesis. A model will be presented, concepts will be defined, and relationships among the concepts will be suggested. These suggested relationships will be stated as hypotheses to be tested. Later, measures will be constructed and data will be presented to either support or not support the hypotheses.

Chapter 2

THEORY AND DEVELOPMENT OF HYPOTHESES

Assumptions About the Nature of Man

It has been suggested that man is unique among life forms in that he has the ability to create and use symbols. No other organism has this ability. White (94) argues the difference is one of kind and not just one of degree. His position is: man uses symbols, no other creature does. He states an organism has the ability to symbolize or it does not; there are no intermediate states.

A symbol may be defined as an abstraction of phenomenon from the real world. The meaning and value of the symbol are assigned by those who use it. A symbol has no direct relationship with the phenomenon which it represents. In short, a symbol is a psychological object.

Man's ability to symbolize and use those symbols he creates, gives him the ability to transcend immediate sensory stimuli in his response to real world phenomena. Bohlen and Beal (21) assert the ability to manipulate symbols is the essence of man's unique intelligence. They explain this is the attribute which allows man to respond rather than react to his environment. All life forms, other than man, must react to stimuli in a simple reflex arc, S → R (stimulus-response). But because of his ability to symbolize, man can respond to stimuli. Rather than reacting directly to a stimulus in a conditioned or habitual response, man has the ability to interpret meaning of the stimulus before responding to it. For man, the simple stimulus-response reflex arc becomes invalid. An intermediate

interpretative process can be added. This can more appropriately be summarized as Stimulus ⟶ Interpretation ⟶ Response.

Other assumptions may be made about the nature of man to better understand this two-step response. These assumptions not only illuminate "how" man's behavior differs from other life forms, but also "why" he behaves as he does. In addition to man being a symbol user, these additional assumptions have been offered:

1. Man is an acting being
2. Man is an organizing being
3. Man is a telic being
4. Man is a conserving being (Bohlen, 20, p. 113 and Yarbrough, 98, p. 24).

The assumption of man as an acting creature does not differentiate him substantially from other living creatures. The point is made that man, like other creatures, must move and respond to his environment (act) in order to live.

In explaining the assumption of man the organizing being, Yarbrough says that "in principle, man shares this tendency to organize the world with all other animals; however, the extent and complexity of man's penchant for organizing and the manner in which he organizes the world is far different from that of any other animal" (Yarbrough, 98, pp. 24-25). Bohlen elaborates this assumption. He assumes

> ...(man) organizes the world around him into cause-effect relationships which appear rational to him. In many instances he does this without taking into consideration all the data which are known or are available to know. Hence, he sometimes assigns relationships among phenomena in the universe which are spurious from the point of view of claims to truth which are empirically verifiable (Bohlen, 20, p. 114).

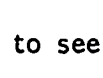
The assumption of man the telic being includes the idea that there is some future state of affairs (ends) which man desires and that there is some means of which he is aware that can be used to attain the desired end. Thus, the assumption is that man can differentiate "what is" from "what is possible."

Man, the conserving being, includes the notion that actions are guided in part to maximize the acquiring or maintaining of goals or ends and to minimize losses.

Review of Cognitive Consistency Theories

From these basic assumptions about the nature of man, the implication may be drawn that man can be, and perhaps is, rational and logical in his responses to his environment. Indeed, this was the position elaborated by philosophers such as Descartes, Spinoza and Leibniz during the Eighteenth Century. Later the notion of a rational economic man was put forward in economics. This approach has recently been pursued in the area of social psychology. The assumption is not so much that man is a rational animal, but that he is a "rationalizing animal." Aronson puts it this way, "...(the approach) does not rest upon the assumption that man is a rational animal; rather, it suggests that man is a rationalizing animal--that he attempts to appear rational both to others and to himself" (Aronson, 7, p. 6). In the last 25 years much theory and research has been generated based upon the "rationalizing man" approach. Collectively, the theories have been referred to as cognitive consistency theories. Most have the common notion that the individual has a need to organize thoughts, sentiments, beliefs, attitudes, and overt behavior in meaningful

and sensible ways (Zajonc, 101). McGuire (75) traces the earliest reference to a modern version of the rational man concept to Sumner's "strain of consistency." However, others, including McGuire, attribute Heider's article on "Attitudes and cognitive organization " (56) as instrumental in initiating subsequent work in this area. Heider's initial work was generally labeled "balance theory." Other similar ideas are referred to under this label as well as others including cognitive consistency, dissonance, symmetry, congruity, etc. The label used in this thesis is "cognitive consistency." Although no case is made for ruling out others, cognitive consistency is sufficiently broad to encompass most of the ideas put forward. The ideas stimulating attention in the literature may be categorized as balance, congruity and dissonance. A brief review of each is presented below.

Balance theory owes its origins to Heider (56). His interest was in the psychological experience of the individual due to variance in the relations with another individual and an impersonal object. Heider limited his analysis to a person (P) and another (O) and to an impersonal entity (X). The impersonal entity could be a physical object, an idea or an event. Heider sought to see how the  relations are organized in P's cognitive structure. He proposed that the relationships between the three elements may be either positive or negative, and according to the particular array of relationships, a set was either "balanced" or "unbalanced." This notion was extended by Cartwright and Harary (29) who contended if the product of the positive or negative signs between the elements was positive the triadic relationship set was "balanced." The

fundamental assumption was that an unbalanced relationship set produced psychological tension and generated forces to restore balance.

Closely related to Heider's conceptualization is the "strain toward symmetry" notion of Newcomb (78). Zajonc (101) reports that in addition to substituting A for P and B for C Newcomb took Heider's notion out of one person's head and applied it to communication among people. The situation to which Newcomb addresses himself is where individual A communicates with individual B about some object (or idea) labeled X. Both A and B have evaluations of object X, as well as knowing the other's evaluation of X. In addition, both have evaluations of the other. Like Heider, Newcomb considers the evaluations to be either positive or negative. Newcomb suggests some courses of action the individual may take to balance the triadic relationship. Among them are: 1) persuade B to change his evaluation of X, 2) change his own evaluation of X, 3) change his perception of B's evaluation of X, 4) stop talking to B about X, or 5) dissociate himself from B. Although Newcomb makes no case for measuring the intensity of the positive or negative evaluations, he does hypothesize that the greater the imbalance the stronger is the drive toward symmetry.

Congruity theory was first suggested by Osgood and Tannenbaum (80). Some writers consider the congruity principle to be a special case of balance (Zajonc, 101 and Bettinghaus, 16). The model is designed to account for changes in evaluations which result from outside information. The situation from which the congruity principle is postulated is the following. An individual is confronted with a statement about an object.

The individual previously had an evaluation of the object. In addition, he is aware of the source of the statement and has evaluations of the source. The congruity principle states that the individual's evaluations of the object and the source will regress in the direction of a common value. For example, if a liked person makes a positive statement about a disliked object the person becomes less liked and the object becomes less disliked. Rather than valence change, as was indicated by balance theory, the congruity principle states that both relationships change, with the magnitude of the shift being inversely proportional to intensities of the interacting reactions (Osgood and Tannenbaum, 80). This means that those elements with strong polarization are more resistant to change than are those of lesser polarization or intensity. Inherent in the congruity principle is the assumption that evaluations are degrees of positiveness and negativeness. Of all the major consistency theories currently extant in the literature, the congruity principle was the first and generally only one attempting to make specific quantitative predictions regarding the outcome of cognitive interaction.

Dissonance theory was proposed by Festinger in 1957 (47). This theory is considered more general than either balance or congruity (Zajonc, 101 and Bettinghaus, 16). Nevertheless, the theory has been exceedingly fertile in the amount of investigation and experimentation it has inspired. Festinger's theory, essentially, is an intrapersonal consistency approach and includes the notion that the human organism tries to establish internal harmony, consistency, or congruity among his opinions, attitudes, knowledge and values. He imagines cognition to be

decomposable into elements, or at least into clusters of elements. Among these elements there is a drive toward consistency. He contends that pairs of elements can exist in irrelevant, consonant or dissonant relations. If two cognitive elements have nothing to do with one another, they are in an irrelevant relationship; if one follows from the other, they are in a state of consonance; and if the "obverse" of one follows from the other, the two elements are in a state of dissonance. The dissonant relationship is considered unstable and motivates a drive for consonance. Three possibilities for reducing dissonance exist: 1) by changing one or more of the elements involved in the dissonant relation; 2) by adding new cognitive elements that are consonant with already existing cognition, or 3) by decreasing the importance of the elements involved in the dissonant relationship. The magnitude of the dissonance or consonance which exists between a pair of elements will be a direct function of the importance of the two elements. The theory predicts that all decisions or choices result in more consonance than dissonance; however, complete consonance is not obtained after a decision because the alternative not chosen usually has some positive features and the alternative chosen usually has some unattractive features.

Festinger and his followers have elaborated the theory in greater detail in their many studies since the theory was put forward almost 15 years ago (47). The theory has generally been supported; but as Bettinghaus points out, it is constructed in such a way that, in practice, almost any reaction on the part of an individual may be construed as confirmation of the theory. Because of this aspect the notions do not stand

up well under rigorous definitions of scientific theory. It has been sharply criticized for this (Jordan, 66).

Summarizing consistency theories Common to consistency theories is the idea that the individual behaves in a way that maximizes the internal consistency of his cognitive system. The popularity of the theories has been attributed to their "theoretical elegance and simplicity" as well as their applicability to a wide range of problems in sociology and social psychology (Curry and Emerson, 34).

A number of parallels and similarities may be drawn among the theories. Important among these are:

1. All assume the individual attributes value and meaning on the objects or ideas he perceives
2. All assume when two or more objects or ideas are in the same conceptual arena, the arena may be described by evaluations of the objects within the arena
3. All postulate that when the values and meanings held toward the objects are internally consistent (one element logically follows from or is related to another) a stable state exists; but when the value and meanings held toward the objects are not internally consistent (one element does not follow from or is not related to another), an unstable, or at least "uncomfortable", state exists
4. A state of inconsistency motivates forces to restore stability within the conceptual arena
5. All consider the forces to restore consistency to be a function of the degree of inconsistency and of the importance of the conceptual arena to the individual.

Application of Communication Stimuli to Consistency Theory

Communication may be defined as the process whereby meaningful symbols are exchanged between a sender and a receiver. This definition immediately calls attention to some of the elements in the communication process including the message sender, the message itself, and the message

receiver. The one additional component delineated in most communication models is the channel through which the message is exchanged. As a sequential process, the communication act may be viewed as having a message sender (the source) who has an idea he wants transmitted to another. That idea is then coded into meaningful symbols (such as language) and transmitted through a channel (voice, writing, etc.) where it confronts the receiver who decodes the symbols meaningful to him to a degree that approximates the idea of the sender. A number of taxonomies or models have been elaborated which utilize these basic components and perhaps add a special uniqueness of their own (Berlo, 13, Hovland and Janis, 60, Schramm, 88, Westley and Maclean, 93, Riley and Riley, 81, Shannon and Weaver, 89 and Lasswell, 71). Some writers (Bettinghaus, 16 and Yarbrough, 98) note that these models not only do not meet some rigorous definitions of model but that they must be augmented with theories and conceptualizations from other disciplines before they become useful in scientific inquiry. Consistency theory is among the ideas frequently used to augment the basic communication models in guiding research in such areas as source credibility and selective exposure to information. Generally, when the link is made between communication models and consistency theories, the focus is upon the communication receiver and the cognitive or behavioral responses occurring when additional information is communicated. This process has been variously labeled as intrapersonal communication (Barker and Wiseman, 9), internal mediating process (Hovland and Janis, 60), and interpretative responses (Yarbrough, 98). A number of applications or tests of cognitive consistency theories have used a

communication stimulus as the independent manipulative variable. In these studies the communication message is designed to increase or decrease cognitive consistency. Data is collected before, possibly during, and after the stimulus and an evaluation is made of the effects of the stimulus upon consistency. Most of the reported research experiments conducted in this way tend to support the theory, or at least the results are interpreted so that the theory is not rejected (Jordan, 66).

A Model for Investigation

In this section a model will be proposed to facilitate understanding internal mediating responses individuals make to communication messages about a social issue. The mediating processes are viewed as occurring within a conceptual arena (Abelson, 1). Each social issue is considered to have a unique set of elements having relevance to the individual for the issue. Categories of the elements are elaborated below. As will be discussed later, all elements are suggested to be systematically related and contribute to the response individuals make to communication messages about a social issue.

Elements

Three types of elements may be delineated as comprising a conceptual arena. These elements are attitudes, beliefs and actions. A fourth, situation, has bearing upon the conceptual arena but exists independent of it.

Attitudes have been described as the primary building stone in the edifice of social psychology (Wicker, 95). This position is not new.

McGuire (76) relates that it has been more than half a century since Thomas and Znaniecki proposed that the study of social attitudes should be the central problem of social psychology. Many definitions exist in the literature; all are not in agreement. Among those writing in the areas of consistency theory, a frequently quoted definition is one by Doob (40), which suggests attitude to be an implicit drive-producing response considered socially significant in the individual's society. Another frequently quoted definition is one by Krech and Crutchfield. They define attitude as "an enduring organization of motivational, emotional, perceptual and cognitive processes with some respect to the individual's world" (Krech and Crutchfield, 69, p. 150). A similar conceptualization is proposed by Rosenberg (86) who also approaches attitude as a multidimensional concept. He sees attitudes as "encompassing consistency between feelings, beliefs, and overt actions elicited by their objects" and as exhibiting a relatively stable constellation among these elements (Rosenberg, 86, p. 15). In a sense, Rosenberg's approach to attitude is broad enough to encompass the totality of the conceptual arena suggested above. Indeed, others following Rosenberg have used attitude as a multidimensional concept and refer to their area of inquiry as "attitude theory" (Greenwald et al., 55). However, this has not always been the case. For example, Rosenberg says:

> ...When social psychologists first began to use the term, they meant by it simply a comparatively stable affective (that is emotional) set or disposition toward some "object"; or speaking operationally, attitude means to them an habitual way of evaluating some aspect of the person's social world. It was acknowledged that beliefs about, and ways of behaving toward, the object of the attitude might be related to the attitude, but these were viewed as external to it (Rosenberg, 87, p. 123).

In this thesis attitude will not be used in the multidimentional sense. Rather it will be used more in accordance to the original usage and refer only to the affective or evaluative orientation the individual has toward a psychological object, or, in the case of this investigation, a social issue. Others (Fishbein, 50) also have recently favored the single dimension approach to attitudes. Fishbein argues that multidimensional concepts are difficult to employ in rigorous theory and are almost unmanageable in research. The definition to which attitude refers hereafter in this investigation is: an attitude is a learned predisposition resulting from evaluating an object either favorably or unfavorably. An individual may have numerous evaluations (attitudes) about an object.

The attitudes which the individual holds may be derived from several sources, including communication messages about the issue. Upon his awareness of a communication message, an individual may make an evaluation regarding the favorability of the message and its content, as well as realigning his existing attitudes about the issue itself. These evaluations are referred to as additudinal or affective acceptance of a communication message.

Thus, if a message about an issue is affectually accepted, attitudes would more nearly coincide with the implicit or explicit conclusion of the message after its transmittal than prior to its sending. If the message was positive toward the issue, then an increase in favorability of attitudes could result. This suggests the following working hypothesis.

> Working Hypothesis 1: If a message about an issue is positive, attitudes toward the issue will be more favorable toward the issue following a message than before it was sent.

Beliefs are the individual's subjective views concerning the nature of the psychological object and the manner in which it exists. They are cognitions of "knowing." When verbalized, beliefs may be considered as "is" statements asserting the existence of a phenomena or relating two or more phenomena. Krech and Crutchfield define belief as "an enduring organization of perceptions and cognitions about some aspect of the individual's world" (Krech and Crutchfield, 69, p. 150). Rokeach (83) reports an individual has thousands of beliefs, and Fishbein (50) suggests that every belief about an object also contains a positive, negative, or neutral evaluative aspect (attitude). The number of beliefs within a conceptual arena are expected to be numerous. Six types of beliefs have been delineated by Fishbein:

1. beliefs about the component parts of the object
2. beliefs about the characteristics, qualitites or attributes of the object
3. beliefs about relations with other objects or concepts
4. beliefs about whether the object will lead to or block the attainment of various goals or valued states
5. beliefs about what should be done with respect to the object
6. beliefs about what the object should or should not be allowed to do (Fishbein, 50, Pp. 110-111).

The last two type delineations differ from the first four in that they contain "should be" relationships. Such relationships have been categorized by others as normative beliefs or sentiments (Yarbrough, 98). Perhaps, theoretically, the last two types may be viewed as beliefs; however, there is a methodological problem in distinguishing between sentiments and attitudes; consequently, in this investigation beliefs will be considered not to include "should" relationships.

Since beliefs are developed from the individual's own needs and out of his past experiences, the possibility arises that an individual may assign erroneous relationships among phenomena when viewed from an objective frame of reference. He may be viewing these relationships from some non-scientific frame of reference. If the scientific method is the standard for assigning relationships between phenomena, it may be observed that the individual may have certain beliefs about relationships for which he has little empirical support. Thus, when these beliefs are subjected to the data standards of science, some beliefs may be valid and others invalid. Such a procedure is considered an inventory of knowledge. Knowledge is viewed as a special type of belief and is considered to have importance in the internal mediating process if relationships between elements in the conceptual arena are based upon a logical and knowledgeable viewpoint. Knowledge may be particularly influential in the internal mediating processes if the social issue has aspects which are of a complex and technical nature.

A second response an individual may make to a communication, then, is belief and knowledge acceptance. Others (Yarbrough, 98) have called this cognitive acceptance of the message. Cognitive acceptance is the degree to which an individual accepts the meanings of a communication message as being valid, factual, or true. Such acceptance, expectedly, would also influence the belief he holds about an issue and the knowledge he has about the characteristics of the issue.

Thus, if a message is cognitively accepted, beliefs and knowledge would more nearly conform to those of the message after its being received than before. Thus, the following working hypothesis is drawn.

Working Hypothesis 2: Beliefs and knowledge about a social issue will be stronger following a message than before it was sent.

Action refers to both symbolic and overt behaviors an individual takes toward an issue. Actions may include symbolic decision making behavior about the acceptance or rejection of a recommended action, or may be overt actions about some aspect of the issue.

Overt action, unless it is a learned habitual response, is preceded by interpretating what is known and what is desired before the overt action is taken. If the action involves an important issue or solution to a problem the interpretation may encompass a set of related behaviors culminating in a decision. This process has been studied extensively by researchers investigating the adoption of innovations (Rogers, 82 and Lionberger, 72) and has been conceptualized as including several stages (Bohlen, 20). However, overt actions have not been studied in depth by those investigating cognitive consistency theory (Fishbein, 50 and Hovland and Rosenberg, 61). Some concepts used by those investigating consistency have been multidimensional in nature and have vaguely included behavior tendencies, but few have used behavior as a third major component when investigating consistency (Insko and Schopler, 62).

Action responses are viewed as much a part of an individual's conceptual arena as are attitudes and beliefs. Indeed, actions taken link symbolic and social behavior. Attitude and belief formations take on importance when they are related to actions.

Responses an individual can make to a communication message are not limited to affective or cognitive acceptance; there are actions he can

take regarding the issue. "Most communication senders desire not only that members of the potential audience attend to, comprehend, and cognitively and affectively accept their message, they also desire that the receivers take some specified overt action" (Yarbrough, 98, p. 50). The findings of adoption-diffusion research are that decision making behavior occurs after an individual has exposed himself to and engaged in communication. And, eventhough important decisions and actions to the individual are not made on the basis of a single communication, some change in decision making in a population may occur from a communication program. This may be viewed as action or conative acceptance of a message. If a message about a social issue is conatively accepted, the extent of actions taken toward the issue will follow those implicitly or explicitly suggested in the message. The following working hypothesis is offered.

> Working Hypothesis 3: The extent of actions taken toward a social issue will be greater following a message than before it was sent.

Situation refers to those external factors in an individual's milieu which exist independent of the conceptual arena, but which may restrict or facilitate behaviors toward a psychological object. The objective situation places parameters on the orientation the individual is likely to develop toward a social issue. Many potential influential situational factors may be delineated as affecting the individual's conceptual arena of a social issue. Among these are the attributes of the general social system in which the individual behaves, the pertinence of the issue within the general social system, characteristics of the specific social unit in which and for which the actor is behaving--e.g., a family, a

business firm, etc., activities of significant others regarding the issue, and certain of the individual's achieved and ascribed social statuses, such as age, marital status, children, education.

Relationships among elements in the conceptual arena

A basic notion of cognitive consistency theory is that if there is an inconsistent orientation towards a psychological object or issue there will be a tendency to resolve the inconsistency. Rosenberg concludes an implication of a number of investigations into this phenomena is that

> ...humans have a need to achieve and maintain affective-cognitive consistency and also that they have a related set of abilities by which they are capable of screening and organizing aspects of available reality so as to achieve and maintain such consistency (Rosenberg, 87, p. 123).

Although the data may be ambiguous in the degree of consistency between elements in the conceptual arena, Festinger (48) concludes the overwhelming evidence is that relationships do exist. A number of researchers have hypothesized and empirically found support for the notion of a high degree of interconnectedness and internal coherence between attitudes and beliefs and that a "drive" toward consistency among these elements exists (McGuire, 75 and 76, Rosenberg, 86, Abelson, 1, Bettinghaus, 17, Jordan, 65, Carlson, 28, Greenberg, 54, Smith, 90, and Woodruff and Divesta, 97).

This leads to another working hypothesis of this investigation.

> Working Hypothesis 4: There will be consistency among attitude and belief elements about a social issue.

As mentioned earlier, some researchers (Insko and Schopler, 62 and Jordan, 65) have extended the attitude-belief consistency notion to include attitude-belief-action consistency. The terminology used varies

somewhat. Insko and Schopler have referred to the organization as affective-cognitive-conative consistency and classify their work as triadic consistency theory. Their approach is one of balance between the three elements and follow the earlier definitions of Cartwright and Harary (29) in assigning balance or imbalance to a triad. Others have called for additional work for incorporating the action element (Fishbein, 50 and Hovland and Rosenberg, 61).

While there is limited research in the area of consistency between these three elements, a logical extension of the attitude-cognitive consistency notions would be to include the action component. This suggests the following general hypothesis.

Working Hypothesis 5: There will be consistency among attitude, belief and action elements about a social issue.

In addition to the action element, situational factors may also be influential in an individual's organization of attitudes, beliefs and actions. Therefore, consistency expectedly would exist not only among the three elements within the conceptual arena but also with situational factors. Certain possibilities and limitations upon the conceptual arena are incurred because attributes of the situation in which an individual acts. Consequently, these must be taken into account in the formation of attitudes and beliefs and in the decision making process about an issue. One possibility is that these factors are dynamically related to elements in the conceptual arena although they exist independent of it. The following working hypotheses are given as suggestions of a possible relationship.

Working Hypothesis 6: There will be consistency among attitude and belief elements and situational factors bearing upon the conceptual arena of a social issue.

Working Hypothesis 7: There will be consistency among action elements and situational factors bearing upon the conceptual arena of a social issue.

Working Hypothesis 8: There will be consistency among attitude, belief and action elements and situational factors bearing upon the conceptual arena of a social issue.

Attitude and belief elements are not only expected to be consistently related to action, but they also are expected to make a contribution in the decision making processes an individual takes about a social issue. Thus, decision making within a conceptual arena would become predictable from other attitude, belief and action elements within the arena if the conceptual arena is organized in a consistent and logical manner. Likewise, the relevant situational elements bearing upon the arena would be influential in decision making. The following hypothesis is suggested.

Working Hypothesis 9: Decision making actions about a social issue will be predictable from attitudes, beliefs and other action elements about the issue and from situational factors bearing upon the conceptual arena of the issue.

Exactly what constitutes consistency has been a weakness in cognitive consistency theories according to some critics (Jordan, 66). Interpretation of some experiments are construed so that regardless of the outcome, the results are taken as support of the theory. The position taken earlier in this discussion was that an individual attempts to appear rational not only to himself but to others as well. Therefore, one way of viewing consistency among elements in the conceptual arena is to look at the consistency or homogeneity among elements based upon an a priori determination of logical and rational relationships. For example, if an

issue is perceived as a legitimate one by most individuals but is generally not controversial, then positive linear relationships would be expected between and among favorability of attitudes, strength of beliefs and knowledges held, and extent of actions taken. This is to say that individuals having higher evaluations of an issue are also more likely to have stronger beliefs and knowledge about the issue, and also to have taken more actions about the issue.

Extent and magnitude of relationships between elements in a conceptual arena

At this point the extent or magnitude of the relationships between the elements is unspecified. Inherent in the discussion, however, is the assumption that the relationships would be greater than expected by chance, but there are a number of reasons why the consistency among the elements and the predictability of a single element from others would not be unitary. When an individual becomes aware of a new psychological object, he organizes it on the basis of his past experiences. Thus, previously held attitudes, beliefs and actions, as well as situational factors, become relevant when an individual becomes aware of a new social issue. Because these original dispositions the individual brings into the new conceptual arena are from other, perhaps diverse, arenas in his world of experience, there may be inconsistencies in the initial attitudes and beliefs formed and actions taken. If a drive toward consistency is not operative, then an inventory of elements in the conceptual arena may reveal numerous inconsistencies. Abelson (1) has found that this, indeed, is the case. Numerous inconsistencies may lie dormant and

unthought about. His position is that if the drive toward consistency were always operative, much more consistency would exist than is found in empirical investigations. The amount of inconsistency present may result from several factors. Three general ones are suggested and one of these will be studied in detail in the remainder of this investigation. The amount of inconsistency between elements within a conceptual arena may be a function of:

1. tolerance of the individual for inconsistencies
2. situational relevance of the psychological object
3. the individual's contact with the issue.

Rosenberg (87) has suggested there is variance between individuals in their "tolerance level" for inconsistency. In this reasoning, some individuals are thought to tolerate more inconsistencies than others before a drive toward consistency and an accompanying realignment within a conceptual arena is realized. This aspect of cognitive consistency theory has not been studied in depth. Rather, it appears as an explanation or an "out" when expected relationships are not found or are not as strong as expected.

Another factor contributing to consistency between the elements in a conceptual arena is the importance it has for the individual and the social system within which it exists. Abelson (1) and Chaffee and Lindner (32) assume the drive toward consistency operates only when the issue is salient; that is, when the issue is being thought about. Berelson and Steiner (11) have found the more interested people are in an issue, the more likely they are to hold consistent positions on that issue. The situational relevance which an individual considers a social issue to have

is an evaluation of importance. As such, it is an attitude, similar to other evaluations. Nevertheless, the importance or salience dimension has been delineated as one having special significance in stimulating a drive toward consistency among elements in a conceptual arena. McGuire (75) in experimental investigations has manipulated the salience aspect and has found that making an issue salient does initiate a drive to reduce inconsistencies about the issue.

In the "life history" of a social issue there may be occasions when it is evaluated as having greater importance (salience) among actors in a generalized social system than at other times. Some public issues may be solved and experience a change in salience, and over time others may be defined as having increasing importance. Some may not be solved, but after having public attention for an extended length of time, may be displaced by other issues.

The last factor affecting consistency relationships among elements in the conceptual arena is the person's contact with the issue. Of particular interest in this investigation is contact with the issue through communication messages. If the social issue is of low salience and generally not controversial, public as well as private communication events may be infrequent. However, on occasions when the individual does receive a communication message about the issue he may not only learn about the issue, but upon self examination of his positions he may discover inconsistencies in his conceptual organization of the issue. Another possibility is that the communication message may introduce inconsistent elements. However, in either case, the message would prompt the individual to

consider the otherwise unthought about issue. If there is a drive toward consistency among elements in and bearing upon a conceptual arena, and if communication inputs elicit this drive, then consistency among elements would be stronger after a message was sent than before.

In studying the effects of political campaign, Berelson and Steiner have found that

> ...the effect of a period of intensive communication and discussion on a topic is to reduce personal inconsistency in opinions, attitudes and beliefs and bring them into greater harmony with one another through resolving conflicts, establishing a priority of loyalties, harmonizing minor issues in line with major ones, etc. (Berelson and Steiner, 11, p. 580).

This finding is taken as support of the consistency increasing effects of communication among attitude and belief elements. However, if the hypothesized extensions of consistency to include relationships among action elements and situational factors as well as attitudes and beliefs exist, then the consistency increasing effects of a message could extend to the totality of the conceptual arena. The following working hypotheses are suggested.

Working Hypothesis 10: Consistency among attitude and belief elements of a conceptual arena will be greater after a communication than before it was sent.

Working Hypothesis 11: Consistency among attitude, belief and action elements of a conceptual arena will be greater after a communication than before it was sent.

Working Hypothesis 12: Consistency among attitude and belief elements and situational factors of a conceptual arena will be greater following a communication than before it was sent.

Working Hypothesis 13: Consistency among action elements of a conceptual arena and situational factors about the arena will be greater following a communication than before it was sent.

Working Hypothesis 14: Consistency among attitude, belief and action elements of a conceptual arena and situational factors about the arena will be greater following a communication than before it was sent.

Following the same line of thinking, increases in the predictability of decision making actions from other elements in and bearing upon the conceptual arena would be greater following a communication input than before it was sent. This is stated in the following working hypothesis.

Working Hypothesis 15: The predictability of decision making actions about a social issue from attitude, belief and other actions elements and situational factors will be greater following a communication input than before it was sent.

The stronger a message is in pointing out discrepancies, the greater would be the accompanying realignment of consistency or increases in predictability. Increments in reducing inconsistency is expected with additional communication inputs; however, the size of the increments might become less with each additional message. This suggestion is based on the idea that the probability of a message pointing out inconsistencies would be less as the consistency between elements becomes stronger and as the prediction of decision making becomes greater. For an issue of low salience, the complication arises in that decay may occur in the consistency among elements when no messages are received. In addition, decay may occur in favorability to which attitudes are held, the strength of beliefs held and the extent of action taken. If an issue does not receive general public attention, the lack of reinforcement for held attitudes might result in their declining. The strength of beliefs, likewise, may decline. In the case of knowledge, individuals may forget certain aspects about the issue. Also, as a result of low public concern, the

individual might reconsider his own actions and not commit himself as strongly as when the issue is more salient. This could result in a decay in actions taken. However, decay of a social issue is thought to be slow and an individual's organizations about an issue may exist long after there is little immediate public concern about it. Therefore, over time when several messages are communicated about a low salience issue some decay may occur between messages if the interval of time between them is long. Nevertheless, the net effect of a series of messages would be increases in the favorability of attitudes, strength of beliefs-knowledge and extent of actions taken as well as consistency among elements and the predictability of decision making behavior. This hypothesized trend is graphically presented in Figure 1. If an issue declines in salience the

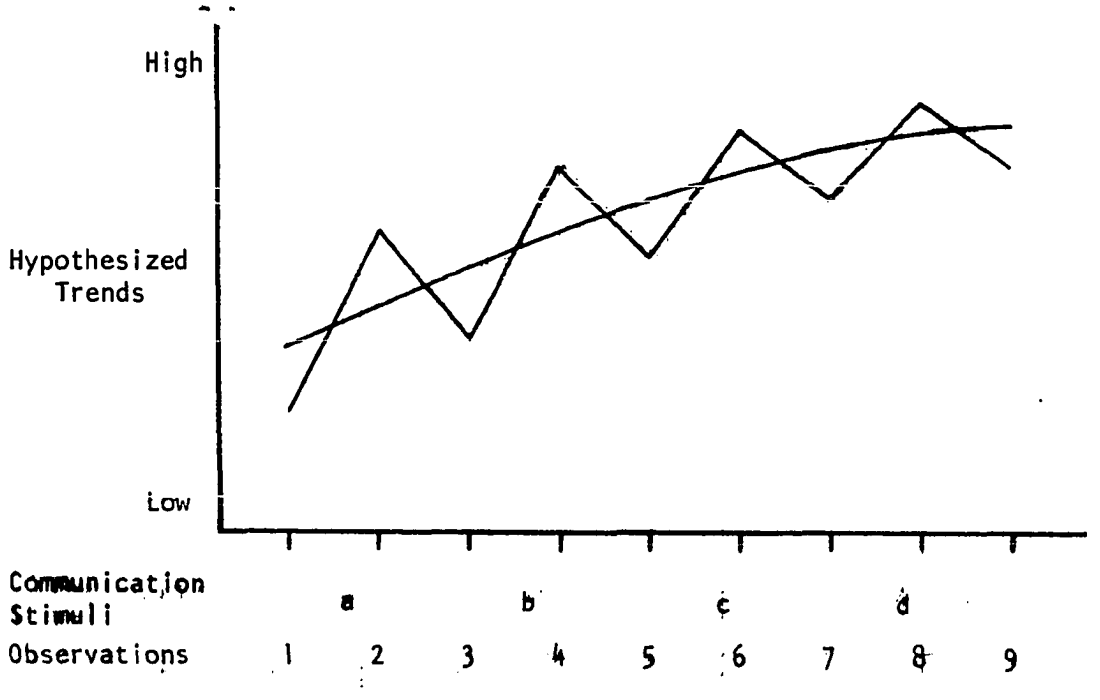


Figure 1. Hypothesized trend in level of individual elements, consistency among elements and predictability of decision making

possibility exists that the decay might become greater than the increasing effects of communication messages. If such were the case, then an overall decline might occur rather than the increase as suggested above.

Limiting the concern to social issues characterized as being low in salience and being generally not controversial, and considering the setting where the sending of a communication message is followed by an extended period of time before another message is sent, the following trends are hypothesized:

General Hypotheses 1-9: An alternating increasing-decreasing response pattern, with the net effect of an overall increase, will occur concomitant with communication events in

-the favorableness of attitudes toward the issue (G.H. 1)

-the strength to which beliefs and knowledge are held about the issue (G.H. 2)

-the extent of actions taken toward the issue (G.H. 3)

-the consistency among favorability of attitudes and strength of beliefs about the issue (G.H. 4)

-the consistency among favorability of attitudes, strength of beliefs and extent of actions taken about the issue (G.H. 5)

-the consistency among favorability of attitudes, strength of beliefs and situational factors about the issue (G.H. 6)

-the consistency among extent of actions taken and situational factors about the issue (G.H. 7)

-the consistency among favorability of attitudes, strength of beliefs, extent of actions taken and situational factors about the issue (G.H. 8)

-the predictability of decision making actions from attitudes, beliefs, other actions and situational factors about the issue (G.H. 9).

In later chapters of this investigation these general hypotheses will be stated at an empirical level and a research design will be implemented to test empirical support for them.

Chapter 3

THE SOCIAL ISSUE INVESTIGATED

Civil Defense as a Social Issue During the 1960's

The general psychological object investigated is civil defense and of particular interest will be the innovation of fallout shelters. The civil defense issue may be defined as encompassing non-military measures taken to minimize casualties to life and property and also to recover from a potential enemy attack. Although civil defense has more than a 50 year history beginning with the Woodrow Wilson administration, the concern in this thesis is during the decade of the 1960's. Perhaps interest in civil defense reached its peak during the early 1960's. Two international crises early in the John F. Kennedy administration prompted this. The first and perhaps the strongest of these was the Berlin blockade during 1961. The second was the Cuban missle crisis in 1962. An important impetus into civil defense was made in the President's address to the nation telling of the danger in the Berlin situation. In it he made a strong plea for civil defense activities and urged citizens to shed their apathy towards the issue. In part, he said:

> In May I pledged a new start on civil defense....Tomorrow I am requesting new funds for the following immediate objectives: To identify and mark spaces in existing structures - public and private - that could be used for fallout shelters in case of attack; to stock these with food, water, first aid kits and other minimum essentials for our survival; to increase their capacity; to improve our air-raid warning and fallout detection systems, including a new household warning system which is now under development; and to take other measures which will be effective at an early date to save millions of lives if needed.
>
> In the coming months I hope to let every citizen know what steps he can take without delay to protect his family in case of attack (Wicker, 96, p. 1).

The President, subsequently, asked for $207 million for marking and stocking of public shelters.

FitzSimons (52) remembers the impact of the speech on civil defense as "staggering." He says, "For the first time in history, a United States President had dramatically supported this dormant federal program" (FitzSimons, 52, p. 42). National magazines began featuring highly favorable articles on shelters (Cater, 30 and Rosa, 85). However, later articles in national magazines appeared which were critical of, or at least questioned, civil defense and fallout shelters as a means of survival (Baldwin, 8, Cousins, 33, Hirshleifer, 57, and Kahn et al., 67). Even though positions may have differed regarding the issue, during this period the issue was salient.

The initial reaction of Congress was to generally support the President's request for appropriations. For fiscal years 1962 and 1963 about three-fourths of the funds requested for marking and stocking fallout shelters was appropriated (Broady and Tufte, 26). However, for fiscal year 1964 funding was an entirely different matter. The President's total request was $695 million, but only about 16 percent of this amount was appropriated. Brody and Tufte (26) report the administration did not vigorously fight for restoration of the full amount. These researchers conclude the legislative history of civil defense has been characterized by a pattern of disinterest, brief enthusiasm, and a subsequent return to low salience. FitzSimons (52) has made the observation that civil defense has acquired a reputation of the shepherd boy who cried "wolf" too often - even though the wolf may actually have lurked close to the flock. One

reason for this, FitzSimons says, is the "tremendous confidence" the American public has historically placed on the military to keep war away from the homeland.

Public Communication Programs About Civil Defense

As an issue, civil defense has stimulated little dialogue in the popular press since the flurry of articles during the early 1960's. A recent exception to this is an article by Bongartz (22). However, the title of this article, "Remember bomb shelters?" attests to the latency of the issue. A recent finding of Yarbrough et al. (100) supports the contention of low salience of civil defense as a social issue. These researchers found the average ranking of civil defense and related issues faced by the American public was among the lowest from a list of several. Although the average ranking of the civil defense issues declined during the period of their study, Yarbrough et al. do not conclude that the issue has declined in salience; rather, they suggest it is being displaced by other issues.

Nevertheless, because civil defense is experiencing latency among the American public, the issue is unusually appropriate for studying effects of communication messages in a natural setting. This is because few messages have been communicated to the public about the issue. Those which have been sent generally have been promotional efforts initiated by or coordinated through the Office of Civil Defense, Washington, D.C. This particularly has been the situation in the population chosen for this investigation (Des Moines, Iowa). During the 1960's three major communication campaigns were carried out in the study population in an

effort to inform the general public about the nature of nuclear radiation, its hazards, and civil defense protective innovations.

The principal protective innovation promoted to the public during the 1960's was fallout shelters. A fallout shelter may be defined as a structure which provides shielding (protection) from nuclear radiation that accompanies nuclear explosions and encompasses a much larger area than does the explosion itself. The concept of fallout shelters assumes that many will survive an initial blast but are vulnerable to the harmful effects of radiation. If exposure to the radiation is minimal then chances of survival are increased. During the 1960's programs within the agency promoted both public shelters and private shelters in individuals' homes. In conjunction with some of the programs, the Office of Civil Defense has sponsored communication programs with the public. The effects of three of the major inputs in stimulating a drive toward consistency among elements in a civil defense fallout shelter conceptual arena are investigated in the remainder of this thesis.

The first of these information programs is labeled in this study as the marking and stocking of public fallout shelters. The marking and stocking of public fallout shelters has been a continuing program of the Office of Civil Defense throughout the 1960's. However, in the study population of this investigation the original marking and stocking of shelters occurred at the time of the Cuban missle crisis (October, 1962), and the activity received considerable coverage in the local news media. The marking and stocking of shelters is also viewed as a culmination of

other messages in national magazines occurring at approximately the same time.

The second major civil defense information message in the community was the Home Fallout Protection Survey (HFPS). In the study population this program was conducted in 1967. HFPS may be viewed as two interdependent communication message sets. The first of these may be labeled as the "questionnaire phase" of the program. In this phase questionnaires were mailed to homeowners by the Bureau of the Census. (A census enumerator visited households which were outside the corporate limits of the community.) Some publicity was carried in the media when this program was initiated. This included accounts of a press conference by the governor announcing the program and urging the public's cooperation. Information collected by the Bureau of the Census was used to compute a "protection factor" of the homes. The protection factor provided a basis for making recommendations for using the home for protection and also for taking steps to increase the protection provided. This information was sent to the households and is viewed as the second message set or "return materials" phase of the program. The return materials information varied by the type of housing and the computed protection factor, but all contained generalized information about characteristics of nuclear radiation. Little mass media publicity occurred during the latter phase of the program. In this investigation, HFPS is viewed as a single information program or communication input.

The third information program about civil defense conducted in the study population during the 1960's was publication of a Community Shelter

Plan (CSP) in the spring of 1969. Like HFPS, Community Shelter Planning is a program conceived, financed, and supervised by the federal Office of Civil Defense. However, unlike HFPS, there is more local involvement in development of the plan. The CSP for the study population was developed by the local planning and zoning commission under a contract with the U.S. Army Corps of Engineers. The local civil defense director was strongly involved in an initiating and advisory role. The goal of the CSP was to provide a workable plan for allocating and moving the population to the best available space providing protection against fallout and to inform residents where to go, how to get there, and what to do in the event of attack. In the study population the plan was published in the form of an advertising supplement to the local newspaper.

In addition to these another, potentially significant, information program was carried out two months before public release of the community shelter plan. This was the distribution of an Office of Civil Defense prepared booklet on what to do in emergencies. The booklet, entitled, "In Time of Emergency," was distributed throughout the public and parochial school systems in the study population during January, 1969. In addition, the booklet was also made available to employees of industrial firms in the city. No accompanying mass media messages were sent concerning distribution of the booklet. Less than half of the households in Des Moines were eligible to receive the booklet by the distribution technique. Research on the impact of the booklet (Yarbrough et al., 100) indicate only about one-fourth of the study population was aware of the booklet and less than 10 percent had minimally read the booklet. The

conclusion of that research was no impact occurred attributable to this communication message. Consequently distribution of the "In Time of Emergency" booklet is disregarded in this investigation.

Chapter 4

METHODOLOGY

Introduction

In this chapter a research design to study the general hypotheses offered in Chapter 2 will be elaborated. The research design will be built about civil defense as a social issue and the specific communication programs described in Chapter 3. How the theoretical concepts were operationalized will be presented. Preceding this is a discussion of sets of data selected to test hypothesized relationships. The data used in this research are part of those collected in conjunction with a series of sociological studies in civil defense conducted by the Department of Sociology and Anthropology of Iowa State University.

Sampling Design for Assessing Trends

Five data collections were made in assessing the impact of three major communications about civil defense occurring in Des Moines, Iowa during the 1960 decade. Before-after studies were conducted for both the Home Fallout Protection Survey and Community Shelter Planning programs, but only an after study was made following the marking and stocking of public fallout shelters.

The first data collection (Sample 1, Time 1) was made following the marking and stocking of public fallout shelters and was conducted in June and July 1963. Responses from 246 adults were obtained. The sampling criterion was a random sample of all households in the city where a husband and wife were living together. As will be discussed later this

criterion is slightly different from the other samples. For Sample 1, as well as for other samples in this investigation, respondents were interviewed by professional interviewers at the respondents' homes.

The second data collection (Sample 2, Time 2) was made just prior to the "questionnaire phase" of the HFPS program. Sample 2 was drawn as an independent sample from Sample 1. Data for Sample 2 were collected in March 1967 from 435 respondents. This was nearly four years after the first data collection. For Sample 2 and for all subsequent samples in this research the sampling area was expanded to include not only the City of Des Moines but all of Polk County. In addition, the sampling criterion was changed to include all adults in the county and not just husband-wife households.

The third data collection (Sample 3, Time 3) was made following the "return materials" phase of HFPS and about six months following Time 2. Respondents in this data collection represent a sample independent of both Samples 1 and 2. Data were collected in September 1967 from 222 respondents.

The fourth data collection (Sample 4, Time 4) was made before publication of the Community Shelter Plan. Interviews were completed with 201 respondents during February 1969 and comprise a sample independent of Samples 1, 2 and 3. The span between Time 3 and Time 4 is approximately 17 months. During this period few messages about civil defense are thought to have occurred in the Des Moines area.

The fifth, and last, data collection (Sample 5, Time 5) was made following publication of the Community Shelter Plan and about three months

after Time 4. Data were collected from 215 respondents during May 1969. Sample 5 is independent of Samples 1, 2, 3 and 4.

These five samples represent observations for the population at their respective time points. The sampling criteria for Sample 1 is slightly different than for the other samples, as is noted above. This difference is not considered to be a serious limitation for two reasons. First, the sampling criteria is not extremely different; second, a major focus in this research is upon relationships among variables. The position is taken that the addition of another point in time, and especially a point crucial to the issue investigated, will contribute more to the research than the minor difference in sampling criteria will limit generalizations of the findings.

The Methodological Design for Assessing Change

When researching the impact of a stimulus, the simplest experiment is to collect baseline data by measuring a phenomenon, introduce an experimental treatment under controlled conditions, and then remeasure the phenomenon. The baseline (before) measurement is compared to the after measurement, and the difference, if any, is attributed to the experimental treatment. When assessing a trend over time this procedure may be repeated for each additional stimuli. This was the procedure followed in this investigation with the exception that no baseline data was collected before the marking and stocking of public fallout shelters. Unfortunately, it is seldom, if ever, possible to subject human behavior to such a simple experimental design and draw completely valid conclusions. The reasons it is not are numerous. For one thing, it is seldom

possible to attain anything approaching perfect control over the experimental situation in human experiments. And, when using human subjects, there are a number of possibilities for the experimenter to introduce biases in his study through the techniques he uses.

As described in Chapter 3, the social issue and the particular communication events chosen for this investigation span much of the 1960 - 1970 decade. When applying a series of before-after measures and putting them in a longitudinal framework, a number of factors affecting elements within the civil defense conceptual arena may have occurred. Some of these can be controlled for, but others cannot. Figure 2 summarizes some of the possible influences.

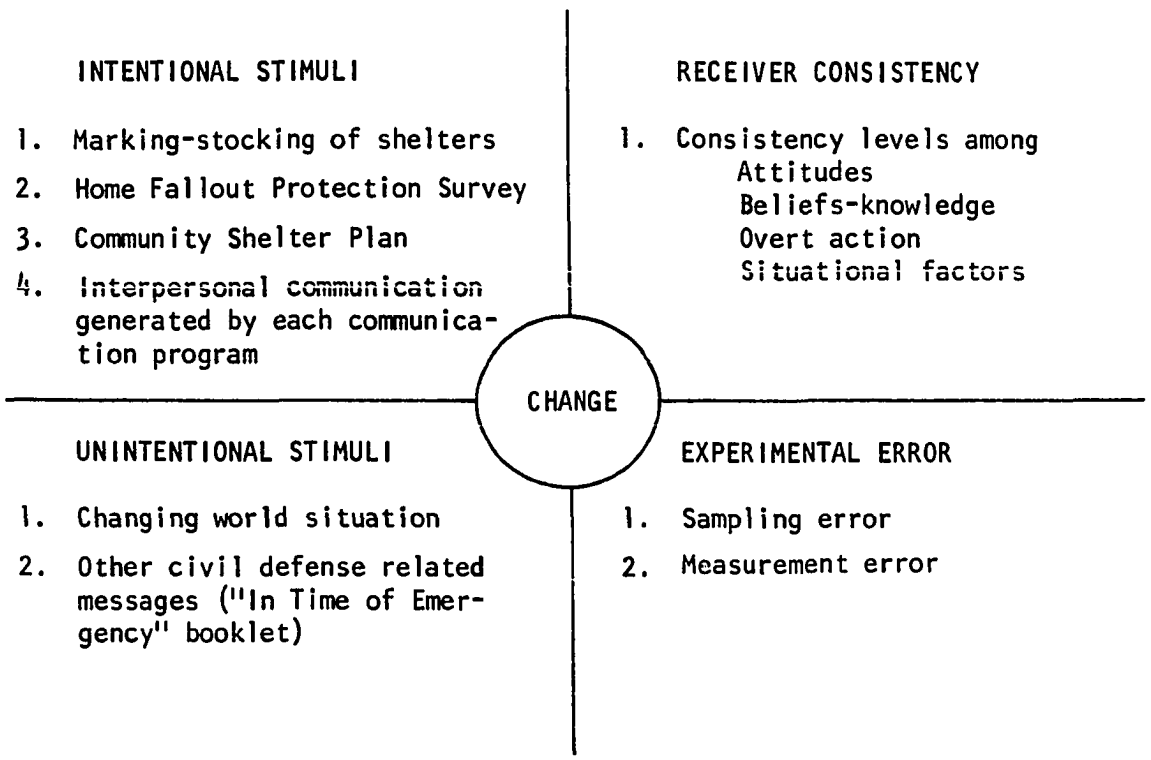


Figure 2. Change and sources of change

Unintentional stimuli In a study of a social issue extending over several years, as does this one, messages other than those generated by the three sets of stimuli focused upon, no doubt, were received by some of the respondents interviewed. Specifically, such other civil defense information efforts as adult education programs, speeches at meetings, and distribution of civil defense booklets could affect the results of the design. Also, the civil defense issue has been shown to be particularly susceptible to changing world situation factors. As discussed in Chapter 3, such Cold War events as erection of the Berlin wall and the Cuban missle crisis greatly affect interest in and concern about the issue.

When researching communication events in a natural setting, it is generally not possible to control for the effects of such unintentional stimuli unless the stimulus is known and built into the research design. However, monitoring of the local setting led to the conclusion that effects of unintentional stimuli were small throughout the six year period under investigation. In the cases of both HFPS and CSP, when the interval of time elapsing between collection of baseline and after data were only a few months, the effects of unintentional stimuli were concluded either to be not present or extremely small. The mass media were monitored throughout the study, but intensively during both HFPS and CSP. Also, during HFPS and CSP local agency records were checked regarding training programs, distribution of literature, as well as speeches made by the local civil defense director and the like. The conclusion in both the HFPS and CSP programs was that, with exception of the respective program,

there was little public dialogue about civil defense, and agency public information activity was at a very low level. Also, the conclusion was drawn that major impacts upon public civil defense behaviors resulting from changes in the world situation during the study period were minimal. During HFPS the Vietnam War continued to esculate and the Arab-Israeli six-day war occurred. During CSP, the Congressional debate over building an anti-ballistic missle system reached its height. However, none of these events raised public discussion about nuclear war. As was discussed in Chapter 2, distribution of a civil defense booklet occurred before CSP, but has been evaluated as having no impact (Yarbrough et al., 100).

The contention is not made that the three sets of stimuli were the only ones communicated in the study population, but the conclusion is drawn that each of the sets of stimuli represent a short period of time when relatively more information was communicated than during the points when no study stimuli occurred in the natural setting and where public concern and dialogue was extremely low.

Experimental error There are a number of experimenter-introduced biases which could affect observed changes. Anytime one uses random sampling techniques to draw conclusions about a population, there is a chance that the sample drawn will not be representative of the total population. If a sample is randomly drawn, the chances that it is not representative of the total population can be determined by using standard statistical tests. In this investigation standard statistical techniques are used to determine if the hypothesized relationship is greater than would be

expected from the effects of sampling error alone. Several techniques are used in this investigation. The characteristics of each and the reason each was chosen is presented individually before its application.

Almost no measure is obtained in the social sciences without a considerable degree of measurement error. That is, the questions asked and the scales devised often give different values for the same position when measured across time and/or across subjects. At best, the researcher can only hope to minimize error of measurement, and it is for this reason that multiple question scales are used and tests of scale reliability and validity occupy so much of the researcher's concern.

Measurement error is generally not a serious problem when one is making group comparisons across time as is done in this study. Measurement errors are usually taken to be random and, across large samples, will tend to equalize. Previous analysis of variables used in this investigation suggest that error of measurement is in the range of 10 to 20 percent of the total scale range when applied to the same individual at two points in time (Yarbrough et al., 100). Although data on error estimate in sociological measures is extremely scarce, there is little reason to expect that the variables delineated in the following sections are any more subject to error than those used in most sociological research.

Receiver consistency As elaborated in greater detail in Chapter 2 the amount of inconsistency among elements in the conceptual arena is expected to be related to the amount of realignment occurring in the conceptual arena. Briefly, the position taken was that the greater the inconsistency among the elements in and bearing upon the conceptual arena,

the greater the probability of a communication message to make these realized and, consequently, the greater the realignment among the elements.

Intentional stimuli The intentional stimuli in this investigation include the three major communication programs. Each of these included a number of stimuli which are expected to influence the behavior of receivers. These stimuli include not only the main messages but also the accompanying promotional messages and the interpersonal communication generated by each of these. Each of the intentional stimuli are discussed in Chapter 3.

Operationalizing Concepts and Measuring Variables

In this section a discussion will be presented on the procedure used in constructing variables selected to represent concepts delineated earlier. Since the investigation is longitudinal and spans five points in time, the added problem of identical measures at all time points is present. Special effort was made to construct all variables identically. This was accomplished for Times 2, 3, 4 and 5; however, on occasion completely comparable data was not collected at Time 1. Substitution was necessary. Where substitutions were made a discussion is included regarding the substitutions as well as an evaluation of the effect it has upon the variable. The concepts were operationalized as follows:

Operationalizing and measuring attitudes As was noted in Chapter 2, an individual holds many attitudes about psychological objects. Similarly, an individual may be expected to have a number of attitudes about civil defense and civil defense activities and innovations. "Research has shown that people generally have quite fully formulated (although

generally non-salient) attitudes about the subject of civil defense and also that for most population there is a wide distribution of dispositions toward civil defense" (Yarbrough, 98, p. 65). In communication programs for the public much of the information has concerned the innovation of fallout shelters. In the early part of the 1960 decade there was debate about the merits of these innovations. Some evaluations were favorable, others unfavorable. From these arguments, statements indicative of attitude toward fallout shelters were constructed. These statements, following the earlier definition of attitudes, either implicitly or explicitly are evaluations, good or bad, favorable or unfavorable. The individual statements are presented on page 116 of Appendix A. Statements included in the data collected at Time 1 differ slightly in wording from the remainder of the data collections. For one statement the response was initially scored differently but was later transformed to conform with scoring of other items. These minor differences in measurement of the variable were considered to introduce no methodological bias. Responses to the statements were scored utilizing the certainty method, which measures not only the direction of favorableness or unfavorableness to a statement but also the intensity with which it is held (Warren et al., 92). Responses to individual questions were transformed to an eleven point normal rank score with values ranging from 0 to 16. The higher the score, the greater was the positive evaluation of fallout shelters. Cluster analysis using inter-item correlations of individual's responses to the statements were calculated. This coefficient of reliability procedure indicates whether scale items fall in the same psychological dimension.

The coefficients of reliability (r_{tt})[1] calculated for the five points in time indicated that the items did scale. The calculated r_{tt}'s were above .70 for all data sets, and little variations in the calculated values were found between samples. The conclusion of the scale analysis is that the response scores to the seven statements can justifiably be summed into a single composite score. Thus, possible scores could range from 0 to 112 points. Distribution of total scores, means, and standard deviations for the five random samples are presented in Table B.1, page 125 of Appendix B. Throughout the remainder of this investigation this variable is referred to as X_1 - attitude toward fallout shelters.[2]

Operationalizing and measuring beliefs and knowledge Beliefs were defined in Chapter 2 as propositions about relationships between phenomena made by the individual. In the civil defense conceptual arena, one belief viewed as having importance in the formation of other beliefs, as well as attitudes and actions, is the individual's perception of the world situation of whether or not a nuclear confrontation might occur and, if so, how it would affect him and his focus of activity. The level of anxiety, the nature of the possible consequences of an attack, and their effects all

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[1]Coefficient of reliability: $r_{tt} = \frac{n\bar{r}}{1+(n-1)\bar{r}}$ where n = number of items and $\bar{r}$ = average inter-item correlation (Kuder and Richardson, 70).

[2]Throughout this section of delineating variables representing concepts, the variables will be designated by the traditional notation for independent variables (X). In certain cases variables are, on separate occasions, used as both an independent and a dependent variables. Where a variable is used in a strictly dependent hypothesized relationship, the traditional dependent variable notation (Y) will be expressed. To avoid confusion, the same subscript number will be used.

contribute to the degree to which there is a felt need for civil defense programs. Policy interest in civil defense has increased and ebbed concurrently with crises in the Cold War.

To assess an individual's perceived threat, five questions were asked about the possible effects of nuclear war. The individual questions are presented on page 117 of Appendix A. Identical questions and scaling procedures were followed for data collected at all five time points. Responses to the questions utilized a Likert-type response technique. Responses were transformed to a normal rank scale ranging from 0 to 6. The higher the score, the greater was the perception of threat. Cluster analysis was conducted to determine if the items scaled along a single dimension and could justifiably be added together to form a composite score. The calculated coefficient of reliability values were similar, ranging from .51 to .56 between the five sets of data. Thus, responses were summed to arrive at a total score ranging from 0 to 30. Throughout the remainder of this investigation this variable is referred to as X_2 - perception of threat. Distribution of total scores, means and standard deviations for the random samples for five points in time are presented in Table B.2 on page 126 of Appendix B.

As was suggested in Chapter 2, knowledge of the psychological object is considered to have influence upon related knowledges and beliefs, as well as upon attitudes and actions within a conceptual arena. In the case of civil defense two dimensions of knowledge were delineated and measured: X_3 - knowledge of local civil defense programs, and X_4 - knowledge of technical aspects of civil defense.

Local civil defense knowledge is included as an assessment of awareness of local activities of preparation, whereas technical knowledge is a measure of competency of the individual to comprehend the highly complex concepts related to nuclear warfare and protection from nuclear radiation.

Local civil defense knowledge was measured by asking respondents three questions. The questions, presented on page 118 of Appendix A, were considered to form a logical filter series. Before a subsequent question was considered the individual must have correctly answered the prior question(s). The possible scores ranged from 0 to 3. Identical questions and scaling procedures were followed for data collected at all five time points. Distribution of scores, means and standard deviations for the random samples at five time points are presented in Table B.3 on page 127 of Appendix B.

Technical knowledge was based upon correctness of response to eight questions about the nature of nuclear fallout and radiation. The questions asked are presented on page 119 of Appendix A. Three items were substituted in the variable for data collected at Time 1. Correctness of response for the substituted questions was less than for the average correctness of response for the items they replaced in the other data sets. However, this same pattern was observed for some of the identical items. The possibility exists that the substituted questions may have a slight tendency to depress observed technical knowledge total scores at Time 1; however, little biasing effect is considered to be operative in the relationship of the variable with other variables.

Responses to the questions were scored on a correct - incorrect basis. To determine the scalability of the items, cluster analysis was

conducted. Calculated r_{tt} values ranged from .55 for data collected at Time 1 to .62 for data collected at Time 5. The distribution of total scores, means, and standard deviations for the random samples at five points in time are presented in Table B.4 on page 128 of Appendix B.

Operationalizing and measuring action The action component was defined as including both overt and symbolic behavior in Chapter 2. Variables representing both types are delineated in this section. The first is an overt action behavior, X_5 - use of competent sources of civil defense information.

The use of competent sources of civil defense information is viewed as a deliberate action by an individual to inform himself of the issue, i.e., to do something about it. The result of using competent sources of information is viewed as an attempt by the individual to acquire data or skill about civil defense related phenomena. As such, it is expected to have ramifications for other civil defense attitudes, beliefs-knowledges, and actions. There are considerable differences among media in both the competence level of information they contain and also in the accessability of the information sources. The use of different sources and sources of higher competence levels is viewed as reflecting greater information seeking actions by an individual. To assess the level of use of competent sources of civil defense information respondents were asked to indicate which of 11 information sources he was presently using to obtain information about civil defense. For the data set collected at Time 1, 17 sources were listed; however, these were combined or omitted

so that the measurement is comparable at all time points. No methodological bias is considered to be introduced by these manipulations. The sources of information inventoried and the competence level assigned to each are presented on page 120-121 of Appendix A. The assumptions for distinguishing competence levels are also presented. Possible total scores range from 0 to 30. Distributions of total scores, means, and standard deviations for the random samples at five time points are presented in Table B.5 on page 129 of Appendix B.

Among the important actions taken in any issue area are those which contribute to solving the problems or dilemmas posed by an issue. Included in these are actions about existing innovations providing solutions to a problem. As discussed earlier, in the issue area of civil defense, fallout shelters are innovations which have been promoted as at least partial solutions to minimizing the effects of nuclear radiation. Although the actual use of fallout shelters is dependent upon the situation, the individual can engage in symbolic decision making behavior regarding the use of shelters. Viewed in this way, the decision to adopt shelters parallels the persepctive taken, in the area of inquiry known as the adoption and diffusion of new ideas and practices (Rogers, 82 and Lionberger, 72). Previously, Klonglan et al. (68) have shown that adoption-diffusion theory and methods are amenable to the adoption of the idea of using fallout shelters. When the notions of adoption are applied to innovations which are used only under a certain set of circumstances that have never been present for the individual, this action component may be viewed as anticipatory adoption. Anticipatory adoption includes

the mental activity of accepting (or rejecting) the idea of using an innovation should the need arise. In addition, anticipatory adoption may include overt behavior augmenting anticipatory adoption of an innovation. In the case of fallout shelters these "means acquisition behaviors" might include building a home fallout shelter, or making plans to improvise one at the time of need, stocking emergency supplies, or selecting a particular public shelter to which to go. In this research only the symbolic decision making process is investigated. Decision making is investigated for two innovations: X_6 - public fallout shelters and X_7 - home fallout shelters. In addition, a composite variable is constructed integrating the decision making level of both innovations. This variable is referred to as X_8 - concurrent adoption of home and public fallout shelters.

Five stages in the symbolic (anticipatory) adoption process were delineated. These are unaware, aware, information, evaluation, and adoption or rejection. Others (Bohlen,20) have used an additional stage, trial, following the evaluation stage if the particular innovation was divisible, i.e., could be used in small quantities. Since fallout shelters are not amenable to trial, delineation of this stage was omitted in operationalizing the adoption variables. Questions used to delineate stage of public fallout shelter adoption are presented on page 122 of Appendix A. Questions used to delineate home fallout shelters are presented on page 123 of Appendix A. It is noted that decision making regarding home fallout shelters is generally relevant to only those having basements. Consequently, the additional stage of no basement was delineated for the adoption of home fallout shelter question series. Where

the variable was used in a dependent framework the samples will be reduced to include only respondents for whom the innovation was applicable.

The perspective taken in operationalizing adoption variables is that in rational decision making, the stages delineated follow a logical sequence. Consequently, for an individual to be classified in the later stages of adoption he must have completed the earlier stages. Categorizing an individual to a designated stage in the adoption process is the result of three considerations: (1) he must have positively answered at least one question in the set of questions for that stage, (2) he must have negatively answered all questions in the set of questions for the next immediate stage, and (3) if he is designated in one of the later stages he must have positively answered at least one question in each of the sets of questions for the earlier stages.

The methodology used was different for variable X_7 - home fallout shelter adoption for data collected at Time 1. In this instance, a single question was asked and the individual chose a response indicating an adoption stage. Other research (Yarbrough et al., 99 and 100) has found this methodological approach to the delineation of adoption stage tends to result in higher adoption levels than when the strict filtering sequence described above is employed. However, the amount of bias has not been reported. The position taken in this investigation is that the methodology for variable X_7 at Time 1 is biased slightly toward higher home fallout shelter adoption, but that this bias is small. What effect it may have, if any, would most likely be on comparison between levels

of adoption at different time points and not upon relationships with other variables.

Distribution of stage of adoption of public fallout shelters, means, and standard deviations for the random samples at five points in time are presented in Table B.6, page 130 of Appendix B. Similar data for home fallout shelter adoption are presented in Table B.7, page 131 of Appendix B.

The position taken in construction of variable X_8 - concurrent adoption of home and public fallout shelters is that either the innovation of public fallout shelters or the innovation of home fallout shelters are alternative solutions to the problem posed by the issue and that, by integrating the two variables, a more discriminating one might result. No additional questions were asked to arrive at the concurrent variable. Rather a cross tabulation of the individual's stage of home fallout shelter adoption and public fallout shelter adoption was made. In doing this, the referent to the particular innovation alternatives is lost. The cross tabulation was abbreviated by combining the information and evaluation categories and referring to them as "decision making." Twelve categories (0-11) were delineated in the abbreviated cross tabulation. As was the case for variable X_7, when variable X_8 is used as a dependent variable, size of the samples will be reduced to include only those respondents who have access to a basement. Distribution of concurrent stages of adoption, means, and standard deviations for the random samples at five time points are presented in Table B.8 on page 132 of Appendix B.

Operationalizing and measuring situational variables The definition of situation of action presented in Chapter 2 included all external

forces impinging upon the conceptual arena of an issue at a particular point in time. The situational factors one may consider in any setting are many. For this investigation two social status variables are included. The first of these is variable X_9 - education. Past civil defense studies (Yarbrough et al., 99 and 100) indicate that the higher the educational level of the person, the more favorable he is to civil defense and other technologically based ideas. Education is viewed as indicative of skill necessary to comprehend the technological nature of the civil defense issue. Education was measured by the individual's response to the question, "How many years of formal education have you completed?" The distribution of responses, means, and standard deviations for the random samples at five points in time are presented in Table B.9 on page 133 of Appendix B.

The second situational variable is X_{10} - age. Age is considered an important factor in the conceptual arena of most social issues including civil defense. The following observations have been made regarding age and its application to civil defense:

> Age is an important determinant of human behavior insofar as it is an indicator of at least three situational aspects of the individual - generation, longevity, and life cycle.
>
> Generation Generation reflects the kind of socialization process through which the individual has passed. The experiences of this socialization process are, by definition, important determinants of the beliefs, attitudes, and behavioral patterns of the individual.
>
> Recent research has shown a curvilinear relationship between the age of an individual and his acceptance of civil defense ideas. Middle aged persons are found to be more favorable to civil defense than are young adults or older persons. The phenomena may be largely a function of generation. There is

some indication that older persons have not acquired the knowledge base necessary to either comprehend the nature of threat posed by nuclear war nor the functioning of civil defense measures to counter this threat. Young adults, while best equipped of all generations to understand the technical aspects of nuclear threat, tend to reject civil defense measures as an acceptable counter measure. It may be that the experiences of World War II and the Cold War make middle aged persons most receptive to civil defense.

Longevity As an individual becomes older, he tends to become more conservative and tends to make decisions directly toward minimizing the possibility of losses rather than maximizing gains. This conservative strategy may be partially explained by the expected longevity of the individual - the total time he will be able to use the innovation. Although time-of-use is an unknown factor in civil defense innovations, expected longevity may still have an effect on decision-making. It is usually implicitly assumed that longevity is at least partially accounted for by age, i.e., the younger a person is the more longevity he possesses.

Life cycle Another dimension measured by age which may be important in predicting civil defense behavior is the stage of life cycle. This may be especially true in the case of the life cycle of the family. As a family matures as a social unit, the role expectations of the various statuses - e.g., father, mother, child - change. For example, younger adults are more likely than older persons to have child rearing responsibilities. These responsibilities make them more prone to accept safety-oriented innovations such as civil defense. (Yarbrough et al., 100, pp. 238-239).

Although the suggestion made above that the strongest relationship between age and other civil defense variables may be a curvilinear function; in this research age was not considered in the curvilinear framework, but was analyzed only as a linear variable. The assumption was that younger age would be associated with greater pro-civil defense activity within the conceptual arena. Age was measured by asking respondents, "How old were you on your last birthday?" Distributions of age categories, means and standard deviations for the random samples at five points in time are presented in Table B.10 on page 134 of Appendix B.

This completes the discussion regarding operationalizing and measuring variables to represent concepts delineated earlier. In the following chapter these variables will be used to construct empirical hypotheses which will be tested for support.

Chapter 5

DATA ANALYSIS AND FINDINGS

Introduction

In Chapter 2 working and general hypotheses were derived and stated in abstract form from the concepts delineated. In Chapter 4 variables were constructed to represent these concepts. In this chapter empirical hypotheses will be offered representing the general hypotheses and data will be analyzed to check for validity of the empirical hypotheses. Frequently, working hypotheses expressed in Chapter 2 were subsequently implicitly contained in the broader trends of the general hypotheses. In these cases specific empirical hypotheses will not be given for the working hypotheses. However, for the working hypotheses not contained in a general hypothesis separate empirical hypotheses will be offered and data will be analyzed to check for their validity.

The general hypotheses involve three major categories of trends. They are:

1. trends for individual elements
2. trends for consistency among elements
3. trends in the predictability of decision making.

The procedure followed in this chapter will be to separately present empirical hypotheses, statistical procedures and findings for the three categories of trends.

Trends for Individual Elements

Empirical hypotheses

The general hypotheses for trend in the individual elements are as follows.

> General Hypotheses 1-3: An alternating increasing-decreasing response pattern, with the net effect of an overall increase, will occur concomitant with communication events in
>
> -the favorableness of attitudes toward the issue (G.H. 1)
>
> -the strength to which beliefs and knowledge are held about the issue (G.H. 2)
>
> -the extent of actions taken toward the issue (G.H. 3)

At the empirical level two trends are suggested in these hypotheses. One is a positive linear increase between the time points. The second is a change in direction of trend occurring with each communication input. Using the research design outlined in Chapter 4, the following empirical hypotheses are offered.

> Empirical Hypotheses 1-8: A positive linear trend will occur through Times 1, 2, 3, 4 and 5 for total scores in variables
>
> X_1 (Y_1) - attitude toward fallout shelters (E.H. 1)
> X_2 (Y_2) - perception of threat (E.H. 2)
> X_3 (Y_3) - knowledge of local civil defense program (E.H. 3)
> X_4 (Y_4) - knowledge of technical aspects of civil defense (E.H. 4)
> X_5 (Y_5) - use of competent sources of civil defense information (E.H. 5)
> X_6 (Y_6) - adoption of public fallout shelters (E.H. 6)
> X_7 (Y_7) - adoption of home fallout shelters (E.H. 7) and
> X_8 (Y_8) - concurrent adoption of home and public fallout shelters (E.H. 8).

The second trend suggested in the general hypotheses would be a quartic trend, beginning with a decreasing function, when applied to the

research design since Time 1 was immediately following a communication input. The following empirical hypotheses are offered.

Empirical Hypotheses 9-16: A quartic trend, beginning with a decreasing function, will occur through Times 1, 2, 3, 4 and 5 for total scores in variables

X_1 (Y_1) - attitude toward fallout shelters (E.H. 9),
X_2 (Y_2) - perception of threat (E.H. 10)
X_3 (Y_3) - knowledge of local civil defense program (E.H. 11)
X_4 (Y_4) - knowledge of technical aspects of civil defense (E.H. 12)
X_5 (Y_5) - use of competent sources of civil defense information (E.H. 13)
X_6 (Y_6) - adoption of public fallout shelters (E.H. 14)
X_7 (Y_7) - adoption of home fallout shelters (E.H. 15)
X_8 (Y_8) - concurrent adoption of home and public fallout shelters (E.H. 16).

The hypothesized trend Empirical Hypotheses 9-16 is for an increase in total scores of the individual variables to occur between Times 2 and 3, and between Times 4 and 5. These are intervals when there were communication inputs. Therefore, it is unnecessary to state direct empirical hypotheses for Working Hypotheses 1-3 (see p. 14 and Pp. 17-18).

Statistical procedures

Whenever a sample is used to draw conclusions about a population, the possibility exists that the sample is not representative of the population. Based on the laws of probability, the chances that a sample is not representative can be determined. The procedure is to state statistical hypotheses representing the empirical hypothesis to be tested. The statistical hypothesis is stated in both a null and alternative form. The null hypothesis, which states no relationship, is the one tested. If the probability of the null hypothesis occurring is within the critical region chosen, then the evidence fail to reject the null hypothesis, and it is

accepted. The alternative hypothesis is rejected. However, if the chance occurrence of the null hypothesis is not within the critical region, the null hypothesis is rejected and the alternative hypothesis is accepted.

The statistical procedure to test Empirical Hypotheses 1-16 will be to measure the trend curve using analysis of variance statistical technique. The samples at five points in time represent treatment groups. The trend comparison was made by entering orthogonal polynomial coefficients into a regression equation as dummy variables (Draper and Smith, 41, pp. 134-141). Although the theoretical interest is in only the linear and quartic trends, to assure orthogonality between comparisons the statistical procedure chosen includes first delineating linear effects and, subsequently, the additional explanation of quadratic, cubic and quartic trends in that order.

The null statistical hypothesis for linear trend is as follows:

$$H_o \text{ (Linear)}: \quad \Sigma[(o_1)\mu_1 + (o_2)\mu_2 + (o_3)\mu_3 + (o_4)\mu_4 + (o_5)\mu_5] = 0$$

where o_i = the orthogonal polynomial coefficient for linear trend

μ_i = the mean effect of the ith treatment for the variable being tested.

The null statistical hypotheses for the test of quadratic, cubic and quartic trends is as follows:

$$H_o \text{ (Quartic)}: \quad \Sigma[(L + Q_1) - L] = 0$$

$$H_o \text{ (Cubic)}: \quad \Sigma[(L + Q_1 + C) - (L + Q_1)] = 0$$

$$H_o \text{ (Quartic)}: \quad \Sigma[(L + Q_1 + C + Q_2) - (L + Q_1 + C)] = 0$$

where L = the effects of the linear trend equation

$L+Q_1$ = the combined effects of linear and quadratic trend equation taken together

$L+Q_1+C+Q_2$ = the combined effects of linear, quadratic, cubic and quartic trend equation taken together.

The alternate statistical hypothesis is that the sums do not equal zero. In the practical application of the test if the calculated F-statistic is greater than the tabular F-statistic for the critical region chosen the null hypothesis is rejected and the alternate hypothesis is accepted.

The calculated F-statistics for each of the trend possibilities for the eight variables are presented in Table 1. A notation is made beside test statistics applicable to a specific empirical hypothesis. Before a final conclusion is drawn, the direction of the trend needs to be determined by the profile of the mean scores to assure the trend observed is consistent with the one hypothesized. Mean scores for the individual variables at the five points in time are found in Table B.1-B.8 in Appendix B.

Conclusions regarding empirical hypotheses

Empirical Hypothesis 1 The statistical analysis of the data leads to a conclusion of an overall linear trend in attitude toward fallout shelters through the five time points. However, upon examination of the profile of the mean scores at the five successive time intervals (see Table B.1), the conclusion is drawn that the linear trend is not a response of the hypothesized stimuli. The greatest increase in mean scores occurred between Time 1 and Time 2. Little variation in observed mean scores occurred between the other time points. Since the interval between Time 1 and Time 2 was one when, according to the research design, no major communication inputs occurred, the conclusion is made that while a statistically significant linear increase did occur in attitude toward

Table 1. Summary of analysis of trend for eight civil defense variables at five points during the 1960 decade. Random samples of households, Des Moines, Iowa

Variables		Overall F-Ratio	Linear F-Ratio	
Y_1	Attitude Toward Fallout Shelters	8.17**	12.00**	(E.H. 1)
Y_2	Perception of Threat	3.59**	9.04**	(E.H. 2)
Y_3	Local CD Knowledge	9.05**	3.98*	(E.H. 3)
Y_4	Technical Knowledge	15.18**	21.07**	(E.H. 4)
Y_5	Competent Information Sources	43.91**	73.91**	(E.H. 5)
Y_6	Public Fallout Shelter Adoption	1.14	0.04	(E.H. 6)
Y_7	Home Fallout Shelter Adoption	32.47**	16.72**	(E.H. 7)
Y_8	Concurrent Adoption	14.72**	11.16**	(E.H. 8)

*Probability of chance occurrence less than .05

**Probability of chance occurrence less than .01

TRENDS			
Quadratic F-Ratio	Cubic F-Ratio	Quartic F-Ratio	
7.04**	12.87**	0.78	(E.H. 9)
2.17	1.70	1.42	(E.H. 10)
30.26**	0.04	1.99	(E.H. 11)
13.19**	19.67**	6.78**	(E.H. 12)
78.36**	22.56**	0.79	(E.H. 13)
2.43	0.00	2.10	(E.H. 14)
19.65**	57.87**	35.67**	(E.H. 15)
11.84**	25.60**	20.30**	(E.H. 16)

fallout shelters the stimuli responsible for this was not those suggested in the theoretical rationale for the general hypothesis.

Since the interval between Time 1 and Time 2 was almost four years a number of factors may have influenced attitudes held toward fallout shelters. During this period civil defense policies took on a low key. There was less public debate than in the late 1950's and early 1960's. The absence of messages and particularly questionning messages, may have resulted in the trend toward a more positive evaluation of fallout shelters.

The possibility of the difference being due to methodological bias is discounted. The same items were used in constructing the variable and the difference in sampling criterion is thought to be minimal for this variable.

Empirical Hypothesis 2 An overall positive linear trend in perception of threat between the five time points was observed. Examination of the profile of the total score means for the variable shows that the overall differences in mean scores between all time points to be rather small, only about five percent of the total score range. Nevertheless, the test shows statistical significance at the .01 level of probability, and the conclusion is drawn that the data do support Empirical Hypothesis 2.

Empirical Hypothesis 3 An overall linear trend in knowledge of the local civil defense program was found. However, upon examination of the profile of mean scores (see Table B.3) the conclusion is drawn that the linear trend is for a decrease in mean scores. A stronger trend is

found for a high-low-high cubic trend. This trend reflects the nature of the communication inputs. The first message, marking and stocking of public fallout shelters, was locally oriented as was the locally prepared Community Shelter Plan. The second message, HFPS, had little participation by local officials. Nevertheless, while the observed trend is explainable on the nature of the messages, Empirical Hypothesis 3 suggesting a positive linear trend between the time points is rejected.

Empirical Hypothesis 4 A strong overall positive linear trend in knowledge of technical aspects of civil defense was observed. However, upon inspection of the profile of total score means for the variable (see Table B.4) there is some doubt whether or not the observed increase occurred because of communication inputs. The largest increase occurred between Time 1 and Time 2, an interval when few messages are thought to have been sent. In addition, a decrease was observed from Time 2 to Time 3, an interval when a major communication program occurred. The increase between Time 1 and Time 2 may be a result of methodological bias. As noted in Chapter 4, completely comparable data was not available for construction of variable Y_4. Three of the eight statements used in building the variable were different than those used at Times 2 through 4. The correctness of responses to the substituted items was somewhat less than for those they replaced as were the items which were identical. Consequently, the methodology may account for a portion of the observed increase in total scores between Time 1 and Time 2. This, coupled with the decrease in the profile between Time 2 and Time 3 discredits the overall

empirical support of Empirical Hypothesis 4 for its application to the general hypothesis.

Empirical Hypothesis 5 The statistical analysis of the data leads to a conclusion of a strong positive linear trend in use of competent sources of civil defense information through the five time points. Examination of the profiles of mean scores (see Table B.5) indicates the greatest increase occurred between Time 1 and Time 2. Observed differences in mean scores between the other time points are considerably less. The difference between Time 1 and Time 2 is not considered to be a result of methodological bias since the variable was constructed similarly for the five time points. Rather, use of competent information may have become more available during the four year interim without a concentrated communication program occurring. Even though there is strong empirical support for Empirical Hypothesis 5, it appears to arise from factors other than those originally considered.

Empirical Hypothesis 6 No trend, including the hypothesized positive linear one, was observed for adoption of public fallout shelters. Therefore, Empirical Hypothesis 6 is rejected.

Empirical Hypothesis 7 As hypothesized, a positive linear trend was observed from Time 1 through Time 5. Upon examination of the profile of mean scores for the five time points, the increases do appear to arise from the communication inputs as predicted. Empirical Hypothesis 7 is accepted on the basis of empirical support indicating the probability of of chance occurrence for the hypothesized trend not occurring to be less than one in one-hundred.

Empirical Hypothesis 8 As hypothesized, a positive linear trend was observed for the concurrent adoption of home and public fallout shelters. Because of the internal relationship of variable Y_8 with variable Y_7, this finding is not surprising. Neither is it surprising that the effect of the internal relationship with Y_6 (adoption of public fallout shelters) tended to dilute the trend. Nevertheless, the conclusion is made to accept Empirical Hypothesis 8.

Empirical Hypothesis 9 The test for a quartic trend after subtracting out the composite effects of linear, quadratic and cubic trends was found to be not significant for attitude toward fallout shelters. The attitude measure tends to not decay when no messages were sent and not to increase when messages were sent. Empirical Hypothesis 9 is rejected.

Empirical Hypothesis 10 No quartic trend occurred in perception of threat for the five time points. Mean scores for four of the five points do conform to the hypothesized quartic trend, beginning with a decreasing function. Nevertheless, the best trend estimate, and the only one with a significant test statistic is the positive linear one. Empirical Hypothesis 10 is rejected.

Empirical Hypothesis 11 Variable Y_3 - knowledge of local civil defense program did not follow a quartic trend. As discussed above, the best estimate of trend in this variable was a high-low-high cubic one. Empirical Hypothesis 11 is rejected.

Empirical Hypothesis 12 A significant quartic trend was observed for knowledge of technical aspects of civil defense. However, upon

examination of the profile of mean scores (see Table B.4) it is noted that the quartic trend begins with a positive function. This is contrary to the hypothesis. Earlier the possibility of a methodological bias was considered for possibily influencing the increase observed from Time 1 to Time 2. However, a post hoc explanation for the decrease between Time 2 and Time 3 is not offered. Nevertheless, the hypothesis of a quartic trend, beginning with a decreasing function for variable Y_4 is rejected.

Empirical Hypothesis 13 A quartic trend was not observed for variable Y_5 - use of competent sources of civil defense information. However, examination of the profile of mean scores indicates increases in level of use of information following the communication inputs. The statistical significance of the cubic trend in this case lends support to this conclusion. Even though four of the five observations do conform to the hypothesized quartic trend, Empirical Hypothesis 13 is rejected.

Empirical Hypothesis 14 As mentioned earlier no significant trend was delineated for variable Y_6 - adoption of public fallout shelters. However, four of five observed mean scores do conform to the hypothesized trend. In addition, the decision categories of the variable do, rather distinctly, conform to a quartic trend beginning with a decreasing function.

Empirical Hypothesis 15 As hypothesized, a quartic trend, beginning with a decreasing function was observed for variable Y_7 - adoption of home fallout shelters. The test statistic indicates the probability of this trend to be a chance occurrance is less than one in one-hundred.

This variable appears particularly sensitive to communication inputs. Empirical Hypothesis 15 is accepted.

Empirical Hypothesis 16 As hypothesized, a quartic trend, beginning with a decreasing function was observed for Y_8 - concurrent adoption of home and public fallout shelters. As was the case for linear trend, this variable exhibits a profile similar to variable Y_7 although it is neutralized somewhat by the effects of Y_6. Nevertheless, Empirical Hypothesis 16 is accepted.

Conclusions regarding the general hypotheses

General Hypothesis 1 There is little support that attitudes of a social issue are sensitive to communication inputs. While an overall increase was observed in the attitude variable used, this increase was not attributable to the communication stimuli under consideration. In addition, there were not significant decreases when no messages were sent.

General Hypothesis 2 Beliefs and knowledge appear to be weakly responsive to communication messages. The response pattern appears to be more one of increases of strength when messages are sent. Decay was generally not observed when no messages were sent.

General Hypothesis 3 Actions do tend to be responsive to communication inputs. As suggested in the hypotheses increases generally followed a message input and decreases when no messages were sent; however, for some variables this pattern was too weak to be considered statistically significant.

Trends for Consistency Among Elements

Preliminary analysis

Before trend in consistency among various elements are analyzed a preliminary examination will be made into the existence of consistency among groupings of conceptual elements suggested to be related in Working Hypotheses 4-8. As first stated in Chapter 2, the working hypotheses are as follows.

Working Hypotheses 4-8: There will be consistency among

- -attitude and belief elements about a social issue (W.H. 4)
- -attitude, belief and action elements about a social issue (G.H. 5)
- -attitude and belief elements and situational factors bearing upon the conceptual arena of a social issue (W.H. 6)
- -action elements and situational factors bearing upon the conceptual arena of a social issue (W.H. 7)
- -attitude, belief and action elements and situational factors bearing upon the conceptual arena of a social issue (W.H. 8).

Consistency at the empirical level is taken to mean an internal relationship among all variables in a specific grouping. Another term might be homogeneity. This term will be operationlized in greater detail in the statistical procedures section.

The following empirical hypothesis is offered to represent Working Hypothesis 4:

Empirical Hypothesis 17: There will be homogeneous relationships among attitude and belief variables (X_1, X_2, X_3 and X_4).

The following empirical hypotheses are offered to represent Working Hypothesis 5:

Empirical Hypothesis 18: There will be homogeneous relationships among attitude belief and action variables (X_1, X_2, X_3, X_4, X_5, X_6 and X_7).

Empirical Hypothesis 19: There will be homogeneous relationships among attitude, belief and action variables (X_1, X_2, X_3, X_4, X_5 and X_8).

The difference between Empirical Hypothesis 18 and Empirical Hypothesis 19 is the substitution of variable X_8 (concurrent adoption of home and public fallout shelters) for variable X_6 (adoption of public fallout shelters) and variable X_7 (adoption of home fallout shelters). The separate hypotheses are considered necessary because of the lack of independence of variable X_8 with variables X_6 and X_7. In subsequent hypotheses concerning consistency of the action element separate hypotheses will be given and will be differentiated by the subscript $action_1$ and $action_2$ where the former includes variables X_6 and X_7 and the latter includes variable X_8. Both versions include variable X_5.

The following empirical hypothesis is offered representing Working Hypothesis 6.

Empirical Hypothesis 20: There will be homogeneous relationships among attitude, belief and situational variables (X_1, X_2, X_3, X_4, X_9 and X_{10}).

The following empirical hypotheses are offered representing Working Hypothesis 7.

Empirical Hypothesis 21: There will be homogeneous relationships among $action_1$ and situational variables (X_5, X_6, X_7, X_9 and X_{10}).

Empirical Hypothesis 22: There will be positive linear relationships among $action_2$ and situational variables (X_5, X_8, X_9 and X_{10}).

The following empirical hypotheses are offered representing Working Hypothesis 8.

Empirical Hypothesis 23: There will be homogeneous relationships among attitude, belief, action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_9 and X_{10}).

Empirical Hypothesis 24: There will be homogeneous relationships among attitude, belief, action$_2$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_8, X_9, and X_{10}).

Statistical procedures

To assess the validity of Empirical Hypotheses 17-24 the five samples were analyzed separately as well as for pooling the data into a composite sample (N = 1319). To assess homogeneity among variables the following analysis was conducted. Correlation matrices were computed for variables X_1 through X_{10}. These are presented in Tables C.1-C.6 in Appendix C. The correlation coefficients were taken as observations between pairs of variables. Using this methodology the number of observations in a given set of variables is $\frac{n^2 - n}{2}$ where n is the number of variables in the grouping for the empirical hypothesis under consideration. Several characteristics of the correlation matrix for variables included in each hypothesis are examined to assess consistency among variables.

The first calculation was for a mean correlation value ($\bar{r}$). This statistic may be taken as a summary indicator of the strength of relationships for the variables under consideration. However, in some instances the number of observations (r_i values) is quite small, and there is a distinct possibility one or two values may have a strong influence on the mean correlation value. Therefore, two measures of dispersion are presented. One of these is the range and is merely the comparison of the lowest and highest values in the matrix. The second of these is an

estimate of variance about the mean correlation value. The statistic is labeled average deviation squared and is calculated as follows

$$\frac{\Sigma(r_i - \bar{r})^2}{n}$$

where r_i = the correlation between a pair of variables and
n = the number of entries in the correlation matrix.

The last indicator of consistency used is the percent of entries in a matrix large enough to be considered statistically significant. In this case the critical region chosen was .01. These descriptive statistics are presented in Table 2.

Conclusions about empirical hypotheses

To facilitate drawing conclusions about the empirical hypotheses three criteria were selected which must be met before a set of variables will be considered positively related (consistent). The following criteria, all of which must be met were selected. For each the critical points are quite liberal and, perhaps, should be more stringent.

1. The mean correlation coefficient ($\bar{r}$) must be at least equal to the size required for statistical significance at the .01 level of probability of chance occurrence.
2. The coefficient of variability must be less than one.[1]
3. At least two thirds of the correlation entries must be statistically significant at the .01 level of probability of chance occurrence.

---

[1] The coefficient of variability measures the amount of variation relative to the size of the mean. Following Blalock (19, p. 73) the formula used for coefficient of variability is

$$\frac{\sqrt{\text{Ave. dev. squared}}}{\bar{r}}$$

Table 2. Consistency among groupings of variables at five points in time and for pooled data

Sets of Groupings	TIME POINTS Time 1 Sample 1 N = 246[a]	Time 2 Sample 2 N = 435[b]	Time 3 Sample 3 N = 222[c]	Time 4 Sample 4 N = 201[d]	Time 5 Sample 5 N = 215[e]	Pooled Samples 1-5 N = 1319[f]
E.H. 17 (A + B)						
$\bar{r}$	.117	.115	.108	.080	.057	.097
Range of r_i's	-.03 to .37	.04 to .22	.01 to .33	-.02 to .23	-.11 to .26	-.01 to .24
Average dev. sq.	.034	.005	.013	.007	.012	.006
% of sign. r_i's	50.0	50.0	33.3	16.7	16.7	66.7
E.H. 18 (A + B + AC_1)						
$\bar{r}$	.212	.165	.190	.154	.144	.162
Range of r_i's	-.16 to .54	.00 to .34	.01 to .41	-.02 to .39	-.11 to .37	-.01 to .36
Average dev. sq.	.031	.009	.015	.015	.019	.010
% of sign. r_i's	71.4	71.4	57.1	42.9	47.6	76.2
E.H. 19 (A + B + AC_2)						
$\bar{r}$	.213	.163	.183	.127	.127	.153
Range of r_i's	-.16 to .55	.04 to .32	.01 to .41	-.02 to .39	-.11 to .32	-.01 to .36
Average dev. sq.	.041	.008	.015	.014	.021	.010
% of sign. r_i's	66.7	66.7	53.3	33.3	40.0	80.0
E.H. 20 (A + B + S)						
$\bar{r}$	.144	.133	.153	.069	.083	.083
Range of r_i's	-.16 to .37	-.07 to .35	-.02 to .46	-.11 to .45	-.24 to .44	-.05 to .24
Average dev. sq.	.026	.013	.021	.018	.033	.009
% of sign. r_i's	53.3	53.3	46.7	13.3	26.7	53.3

E.H. 21 (AC_1 +S)

$\bar{r}$	.240	.205	.217	.152	.161	.138
Range of r_i's	.11 to .54	.03 to .39	-.05 to .37	-.02 to .29	-.07 to .29	-.15 to .32
Average dev. sq.	.017	.010	.012	.014	.011	.013
% of sign. r_i's	60.0	90.0	80.0	40.0	70.0	90.0

E.H. 22 (AC_2 + S)

$\bar{r}$	.253	.220	.232	.122	.132	.120
Range of r_i's	.06 to .55	.06 to .39	-.02 to .37	-.02 to .29	-.07 to .29	-.15 to .25
Average dev. sq.	.030	.012	.015	.010	.013	.017
% of sign. r_i's	50.0	83.3	-3.3	33.3	50.0	83.3

E.H. 23 (A + B + AC_1 + S)

$\bar{r}$	.198	.163	.190	.125	.137	.129
Range of r_i's	-.16 to .54	-.07 to .39	-.05 to .46	-.11 to .45	-.24 to .44	-.15 to .36
Average dev. sq.	.025	.012	.018	.017	.024	0.12
% of sign. r_i's	63.9	69.4	61.1	33.3	47.2	69.4

E.H. 24 (A + B + AC_2 S)

$\bar{r}$	.197	.162	.187	.104	.123	.119
Range of r_i's	-.16 to .55	-.07 to .46	-.02 to .46	-.11 to .45	-.24 to .44	-.15 to .36
Average dev. sq.	.031	.012	.019	.017	.028	.013
% of sign. r_i's	60.7	64.3	57.1	25.0	39.3	64.3

---

[a]For N = 246 probability of chance occurrence of r_i being greater than .146 is less than .01

[b]For N = 435 probability of chance occurrence of r_i being greater than .111 is less than .01

[c]For N = 222 probability of chance occurrence of r_i being greater than .154 is less than .01

[d]For N = 201 probability of chance occurrence of r_i being greater than .162 is less than .01

[e]For N = 215 probability of chance occurrence of r_i being greater than .157 is less than .01

[f]For N = 1319 probability of chance occurrence of r_i being greater than .064 is less than .01

A determination of whether of not specific empirical hypotheses meet the above criteria is summarized in Table 3.

Empirical Hypothesis 17 Little consistency was observed among attitude and belief variables. When analyzing the five samples individually none met the necessary criteria for acceptance. The pooled data did. However, when considering the large size of the pooled analysis and the critical levels chosen for acceptance, this does not lend strong support of high relationships among attitude and belief variables.

Empirical Hypothesis 18 The addition of action$_1$ variables to attitude and belief variables does increase the consistency somewhat. For this grouping not only the pooled data, but also two of the five samples met the necessary criteria for acceptance. Examination of the correlation tables (see Appendix C) suggests the strength of relationships among the action variables are stronger and uniformly stronger than is the case when attitude and belief variables are considered separately.

Empirical Hypothesis 19 The same pattern of consistency was found for Empirical Hypothesis 19 as for Empirical Hypothesis 18. The difference in the two sets of data for these hypotheses is that the action$_2$ set of variables was substituted for the action$_1$ set. The similarity of findings is not surprising since many of the entries in these two groupings are shared.

Empirical Hypothesis 20 None of the samples, or the pooled data, met the criteria necessary for acceptance of Empirical Hypothesis 20. Indeed, only one sample met as many as two of the three necessary criteria. Three samples plus the pooled sample met none of the criteria. Therefore,

Table 3. Summary for consistency criteria for Empirical Hypotheses 17-24[a]

Empirical Hypotheses for sets of variable groupings	Time 1	Time 2	Time 3	Time 4	Time 5	Pooled
E.H. 17						
Criterion 1		X				X
Criterion 2		X				X
Criterion 3						X
Conclusion	Reject	Reject	Reject	Reject	Reject	Accept
E.H. 18						
Criterion 1	X	X	X			X
Criterion 2	X	X	X	X	X	X
Criterion 3	X	X				X
Conclusion	Accept	Accept	Reject	Reject	Reject	Accept
E.H. 19						
Criterion 1	X	X	X			X
Criterion 2	X	X	X	X		X
Criterion 3	X	X				X
Conclusion	Accept	Accept	Reject	Reject	Reject	Accept
E.H. 20						
Criterion 1		X				
Criterion 2		X	X			
Criterion 3						
Conclusion	Reject	Reject	Reject	Reject	Reject	Reject
E.H. 21						
Criterion 1	X	X	X		X	X
Criterion 2	X	X	X	X	X	X
Criterion 3		X	X		X	X
Conclusion	Reject	Accept	Accept	Reject	Accept	Accept
E.H. 22						
Criterion 1	X	X	X			X
Criterion 2	X	X	X	X	X	
Criterion 3		X	X			X
Conclusion	Reject	Accept	Accept	Reject	Reject	Reject

[a]An X indicates the criterion was met

Empirical Hypotheses for sets of variable groupings	Time 1	Time 2	Time 3	Time 4	Time 5	Pooled
E.H. 23						
Criterion 1	X	X	X			X
Criterion 2	X	X	X			X
Criterion 3		X				X
Conclusion	Reject	Accept	Reject	Reject	Reject	Accept
E.H. 24						
Criterion 1	X	X	X			X
Criterion 2	X	X	X			X
Criterion 3						
Conclusion	Reject	Reject	Reject	Reject	Reject	Reject

the conclusion is strong that there is not consistency among attitude, belief and situational variables.

Empirical Hypothesis 21 Of the empirical hypotheses examined in this section, greatest support is found for Empirical Hypothesis 21. Three of the five samples plus the pooled data met the necessary criteria for acceptance. The data tend to support the hypotheses of consistency between situational and action$_1$ variables.

Empirical Hypothesis 22 When the substitution is made for action$_2$ variables with situational variables, somewhat less consistency is observed. Two of the five samples meet the acceptance criteria. Three samples and pooled data do not. Therefore, the conclusion is drawn that there is generally lack of support for Empirical Hypothesis 22.

Empirical Hypothesis 23 Support for Empirical Hypothesis 23 is found for only one sample and the pooled data. Two additional samples meet criteria 1 and 2 but not criterion 3. Therefore, the conclusion is drawn that the data generally do not support the hypothesis of consistency among attitude, belief, action$_1$ and situational variables.

Empirical Hypothesis 24 None of the samples, or the pooled data, support Empirical Hypothesis 24. For three of the samples and the pooled data two of the criteria were met. In all these cases criterion 3 requiring at least two-thirds of the entires to be statistically significant was the one not met.

Conclusions for working hypotheses

Working Hypothesis 4 The data do not support the notion of consistency between attitude and belief elements within a conceptual arena.

Although, consistency theory is based upon a high degree of dynamic relationship between affect (attitude) and cognition (belief), for the civil defense conceptual arena this notion is not supported. In the data set used here, the relationships between variables were not, or were only minimally, significant from random variation. This is much less than the relationship implied in the term consistency.

Working Hypothesis 5 Although somewhat more consistency was observed between attitude, belief and action variables than for attitude and belief variables alone, the relationships were quite small. For the case of civil defense, the conclusion of weak support was found for the Working Hypothesis 5. Most of the consistency in this grouping of elements comes from action.

Working Hypothesis 6 No support can be concluded for Working Hypothesis 6. The overall consistency among attitude and belief elements and situational factors appears to be less than for attitude and belief elements taken by themselves.

Working Hypothesis 7 Moderate support is concluded for Working Hypothesis 7. Consistency among the action elements of the civil defense conceptual arena and situational factors is the strongest of those investigated. The consistency is much stronger than for the attitude and belief elements.

Working Hypothesis 8 The data analyzed suggests only very weak support for Working Hypothesis 8. Attitude, belief and action elements of the civil defense conceptual arena and situational factors bearing upon it generally are not consistently related.

Summary With the exception of consistency among the action element and situational factors there is little consistency among elements in and bearing upon the civil defense conceptual arena. The lack of support for Working Hypotheses 4-8 cast doubt upon the basic relationships hypothesized or assumed in cognitive consistency theories.

Primary analysis

The overall analysis in this section concerns trends in consistency between various groupings of elements within the conceptual arena as response to communication inputs. However, the results of the preliminary analysis which found little consistency between elements casts some doubt upon the advisability of investigating trends. If consistency is nonexistent or very low, then only limited analysis is justifiable. Therefore, analysis into trends in consistency suggested in General Hypotheses 4-8 will be limited to descriptive analysis of profile trends.

The General Hypotheses suggesting trend in consistency are as follows.

General Hypotheses 4-8: An alternating increasing-decreasing response pattern, with the net effect of an overall increase, will occur concomitant with communication events in

- -the consistency among favorability of attitudes and strength of beliefs about the issue (G.H. 4)
- -the consistency among favorability of attitudes, strength of beliefs and extent of actions taken about the issue (G.H. 5)
- -the consistency among favorability of attitudes, strength of beliefs and situational factors about the issue (G.H. 6)
- -the consistency among extent of actions taken and situational factors about the issue (G.H. 7)

-the consistency among favorability of attitudes, strength of beliefs, extent of actions taken and situational factors about the issue (G.H. 8).

At the empirical level two trends are suggested in these hypotheses. One is a positive linear increase in consistency between the time points. The second is a change in direction of trend occurring with each communication input. Using the research design outlined in Chapter 4, the following empirical hypotheses are offered.

Empirical Hypotheses 25-32: A positive linear trend will occur through Times 1, 2, 3, 4 and 5 for homogeneity of relationships among

-attitude and belief variables (X_1, X_2, X_3 and X_4) (E.H. 25)

-attitude, belief and action$_1$ variables (X_1, X_2, X_3, X_4, X_5, X_6 and X_7) (E.H. 26)

-attitude, belief and action$_2$ variables (X_1, X_2, X_3, X_4, X_5 and X_8) (E.H. 27)

-attitude, belief and situation variables (X_1, X_2, X_3, X_4, X_9 and X_{10}) (E.H. 28)

-action$_1$ and situational variables (X_5, X_6, X_7, X_9 and X_{10}) (E.H. 29)

-action$_2$ and situational variables (X_5, X_8, X_9 and X_{10}) (E.H. 30)

-attitude, belief, action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_9 and X_{10}) (E.H. 31)

-attitude, belief, action$_2$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_8, X_9, and X_{10}) (E.H. 32).

When applied to the research design, the second trend suggested in the general hypotheses would be a quartic trend, beginning with a decreasing function, since Time 1 was immediately following a communication input. The following empirical hypotheses are offered.

Empirical Hypotheses 33-40: A quartic trend, beginning with a decreasing function, will occur through Times 1, 2, 3, 4 and 5 for homogeneity of relationships among

-attitude and belief variables (X_1, X_2, X_3 and X_4) (E.H. 33)

-attitude, belief and action$_1$ variables (X_1, X_2, X_3, X_4, X_5, X_6 and X_7) (E.H. 34)

-attitude, belief and action$_2$ variables (X_1, X_2, X_3, X_4, X_5 and X_8) (E.H. 35)

-attitude, belief and situational variables (X_1, X_2, X_3, X_4, X_9 and X_{10}) (E.H. 36)

-action$_1$ and situational variables (X_5, X_6, X_7, X_9 and X_{10}) (E.H. 37)

-action$_2$ and situational variables (X_5, X_8, X_9 and X_{10}) (E.H. 38)

-attitude, belief, action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_9 and X_{10}) (E.H. 39)

-attitude, belief, action$_2$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_8, X_9 and X_{10}) (E.H. 40).

The hypothesized trend in Empirical Hypotheses 33-40 is for an increase in homogeneity among the sets of variables occurring between Times 2 and 3 and between Times 4 and 5. These are intervals when there were few communication inputs. Therefore, to state direct empirical hypotheses for Working Hypotheses 10-15 is unnecessary (see Pp. 25-26 for these working hypotheses).

Statistical procedures

Because of the general lack of homogeneity among sets of elements in the preliminary analysis only one indicator of homogeneity will be used in the cursory examination of trends. This will be the mean correlation coefficient statistic ($\bar{r}$). The procedure will be to plot the profile of

$\bar{r}$ at five points in time for each of the empirical hypothesis. This is done in Figures 3 and 4. Figure 3 contains the trend profiles for all groupings except those including the $action_2$ set. Figure 4 contains the trend profiles for all groupings except those including the $action_1$ set. The two versions are presented to reduce the number of trends plotted on a single figure and to facilitate visual examination of the trends.

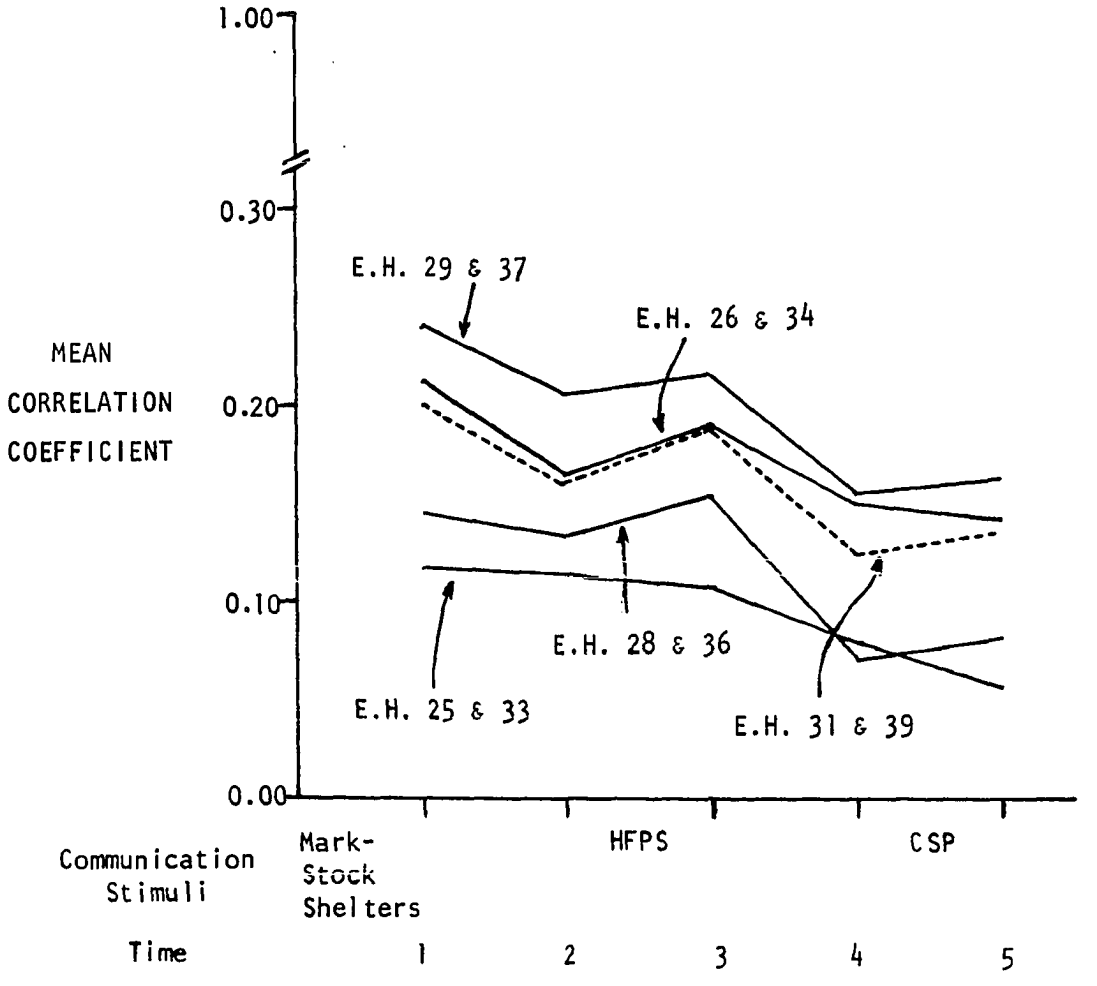

Figure 3. Trend in mean correlation coefficient ($\bar{r}$) between Times 1, 2, 3, 4 and 5 for set of variable groupings (Version 1)

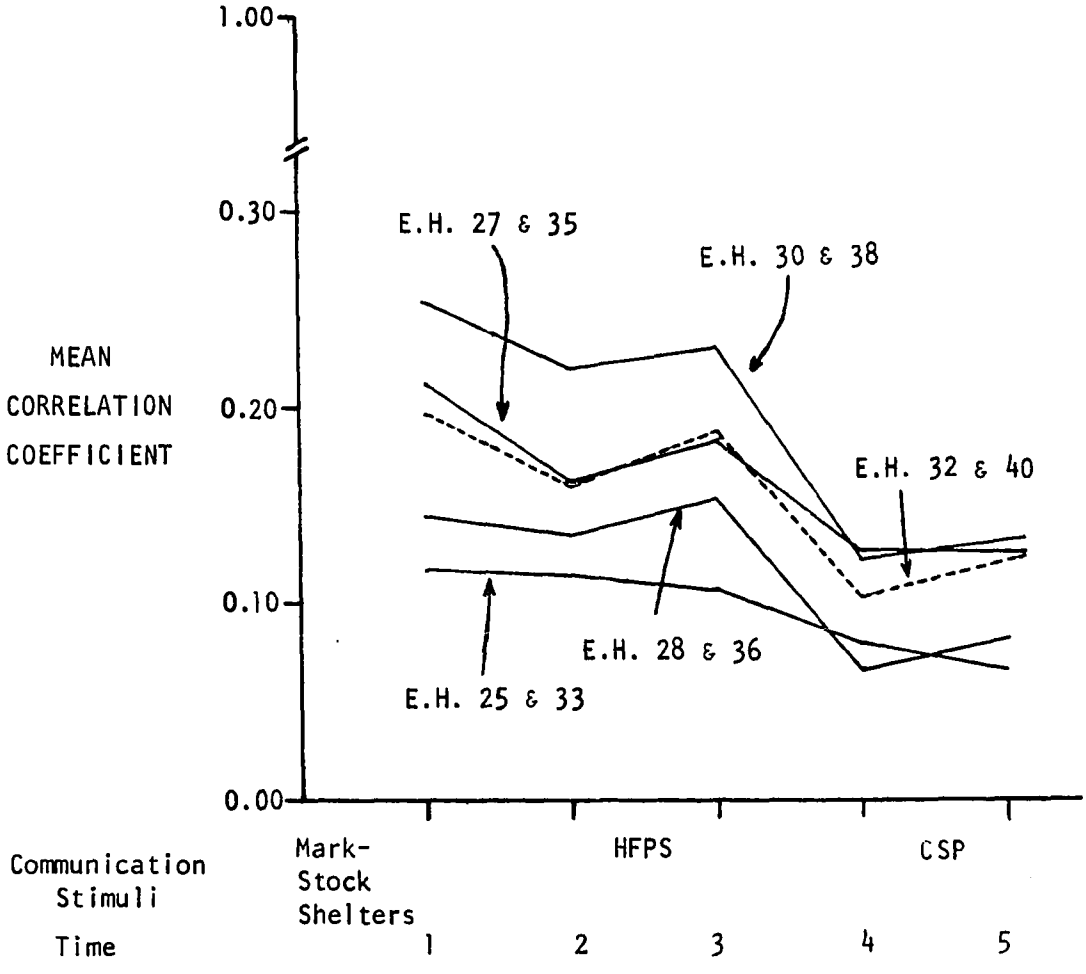

Figure 4. Trend in mean correlation coefficient ($\bar{r}$) between Times 1, 2, 3, 4 and 5 for sets of variable groupings (Version 2)

In the examination a linear trend will be concluded to exist if the observed $\bar{r}$ values visually appear to follow a pattern. A quartic trend will be concluded to exist if all of the $\bar{r}$ values minimally conform to the hypothesized trend. For the quartic trend the random probability of conformity is 2^5 or one in 32. Therefore, minimal conformity will be considered as adequate support.

Conclusions about empirical hypotheses

Empirical Hypotheses 25 and 33 An overall linear decrease, rather than increase, was observed for homogeneity among attitudes and belief. Decreases in homogeneity are observed with each successive point in time. There is no evidence of increases in homogeneity of attitudes and beliefs resulting from communication inputs. Empirical Hypotheses 25 and 33 are rejected.

Empirical Hypotheses 26 and 34 An overall linear decrease, rather than increase, was observed for homogeneity among attitudes, beliefs and action$_1$ variables. The hypothesized quartic trend is followed for four of the five points. There is an indication that communication events did contribute to an increase in homogeneity in one instance and possibly reduce decay in the other. Nevertheless, both Empirical Hypotheses 26 and 34 are rejected.

Empirical Hypotheses 27 and 35 Empirical Hypotheses 27 and 35 show similar trend to Empirical Hypotheses 26 and 34. This is expected since five variables between the two groups are the same. Both Empirical Hypotheses 27 and 35 are rejected.

Empirical Hypotheses 28 and 36 An overall linear decrease, rather than increase, was observed for homogeneity among attitudes, beliefs and situational variables. However, the hypothesized quartic trend of Empirical Hypothesis 36 was followed for each of the time points. Empirical Hypothesis 28 is rejected but Empirical Hypothesis 36 is accepted.

Empirical Hypotheses 29 and 37 An overall linear decrease, rather than increase, was observed for homogeneity among action$_1$ and situational

variables. However, the hypothesized quartic trend of Empirical Hypothesis 37 was observed through each of five points in time. Empirical Hypothesis 29 is rejected, but Empirical Hypothesis 37 is accepted.

Empirical Hypotheses 30 and 38 Little difference was observed in the profile of homogeneity among action and situation variables when the $action_2$ set was substituted for the $action_1$ set. A quartic trend, beginning with a decreasing function was observed; however, the net effect of trend was a decrease in homogeneity among the variables. Therefore, Empirical Hypothesis 30 is rejected and Empirical Hypothesis 38 is accepted.

Empirical Hypotheses 31 and 39 As has been the case for all other groupings, a linear decrease, rather than increase, was observed for homogeneity among attitude, belief, $action_1$ and situational variables. And as was the case for most of the others, the hypothesized quartic trend was observed. Therefore, Empirical Hypothesis 31 is rejected and Empirical Hypothesis 39 is accepted.

Empirical Hypothesis 32 and 40 Little difference was observed when the $action_2$ set was substituted into the attitude, belief, action and situation variable grouping. Empirical Hypothesis 32 is rejected, but Empirical Hypothesis 40 is accepted.

Conclusions about general hypotheses

Consistency among elements in the civil defense conceptual arena were found to be quite weak at all the time points studied. However, without exception, the relationships observed were strongest at Time 1 and lowest at either Time 4 or 5. The same basic trend in consistency was found

regardless of the grouping. An exception to this was the successive linear decrease in consistency among attitude and belief elements. As was observed earlier for level in extent of action, the action elements seem sensitive to communication messages. Similar to the findings of increase in extent of action, increases in the consistency of action with other elements was observed following communication inputs.

Consistency between elements did not increase over time as hypothesized in the general hypotheses. Rather linear decreases were observed. Even though consistency was low throughout the study period, the observed uniformness in decay is convincing. The conclusion is drawn that decay occurred in the civil defense conceptual arena. And, while communication inputs tended to offset or delay the decay, they were not strong enough to stop it. For consistency among the attitude and belief elements, however, the inputs appeared to have no effect.

Trends in the Predictability of Decision Making

Preliminary analysis

Before hypothesized trends in decision making behavior from other elements in and bearing upon the civil defense conceptual arena are analyzed, a preliminary examination will be made into the presence of predictability of decision making variables from attitude, belief, other action and situational variables. As first stated in Chapter 2, the working hypothesis was as follows:

> Working Hypothesis 9: Deicision making actions about a social issue will be predictable from attitudes, beliefs and other action elements about the issue and from situational factors bearing upon the conceptual arena of the issue.

The following empirical hypotheses are offered to represent Working Hypothesis 9.

Empirical Hypothesis 41: Adoption of public fallout shelters (Y_6) will be predictable from attitude, belief, other action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_7, X_9 and X_{10}).

Empirical Hypothesis 42: Adoption of home fallout shelters (Y_7) will be predictable from attitude, belief, other action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_6, X_9 and X_{10}).

Empirical Hypothesis 43: Concurrent adoption of home and public fallout shelters (Y_8) will be predictable from attitude, belief, other action$_2$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_9 and X_{10}).[2]

Statistical procedures

Empirical Hypotheses 41-43 will be tested separately for each of the five samples. The statistical test chosen for testing these hypotheses is multiple correlation coefficient. In these hypotheses the interest is in the total explanatory power the independent (X) variables have on a dependent (Y) one. The multiple correlation coefficient is a measure of goodness of fit and incorporates the contribution of all independent variables upon a single dependent variable (Blalock, 19, p. 346). In writing the multiple correlation equation, Blalock says

> ...we first let one of the independent variables do all the explaining it can. We then permit the second independent variable to go to work on that portion of the variation left unexplained by the first. In order to avoid duplication, however, we must control for this first independent variable. We then permit the third to explain all it can of the remainder, now controlling for both of the first two independent variables. The process can be extended indefinitely. (Blalock, 19, p. 346).

The multiple correlation does not provide an indication of the contribution each independent variable makes toward explanation of the dependent

variable. Other statistical procedures such as stepwise, forward selection, backward elimination, or stagewise multiple regression analysis would give this indication (Draper and Smith, 41, pp. 163-177). However, for this investigation the interest is in total explanation among the variables selected as representing elements in or bearing upon the civil defense conceptual arena. No theoretical rationale was derived for the relative contribution of the various elements in and bearing upon decision making in the conceptual arena.

The null statistical hypothesis for the multiple correlation coefficient is

H_o: All $\beta_i = 0$

where β_i = the weight applied to an independent variable in finding predicted values of the dependent variable.

The alternative hypothesis is that all β_i do not equal zero.

In the practical application, if the calculated F-statistic (Mean Square Regression divided by Mean Square Residual with k and n-k-1 degrees freedom) is greater than the tabular F-statistic the null hypothesis is rejected and the alternative one accepted.

In addition to calculating the multiple correlation coefficients and determining their statistical significance, confidence intervals were drawn about each. The confidence interval gives an indication of the range of where the true association might fall. These data are presented in Table 4.

Table 4. Prediction of adoption of fallout shelters from eight civil defense and situational variables for Samples 1, 2, 3, 4 and 5[a]

	TIME				
Variables	After Mark-Stock Shelters Sample 1	Before HFPS Sample 2	After HFPS Sample 3	Before CSP Sample 4	After CSP Sample 5
Public Fallout Shelter Adoption					
Multiple correlation coefficient	.59**	.46**	.45**	.45**	.48**
Confidence interval (95%)	.50-.67	.38-.53	.34-.55	.33-.56	.36-.58
Home Fallout Shelter Adoption (Reduced samples)					
Multiple correlation coefficient	.46**	.41**	.48**	.48**	.34**
Confidence interval (95%)	.36-.56	.32-.49	.37-.58	.36-.59	.20-.46
Concurrent Adoption (Reduced samples)					
Multiple correlation coefficient	.64**	.50**	.50**	.43**	.40**
Confidence interval (95%)	.56-.71	.41-.57	.39-.60	.30-.54	.27-.52

[a]Concurrent adoption is predicted from seven rather than eight variables

**Significant at .01 level of probability

Conclusions about empirical hypotheses and working hypotheses

The multiple correlation coefficients for each of the dependent variables were all statistically significant at the .01 level of probability of chance occurrence for all the samples. Therefore, the conclusion is drawn that decision making behavior is predictable from other elements in and bearing upon the civil defense conceptual arena.

Primary analysis

Having found support for the hypothesis that decision making behaviors are predictable, analysis will now be carried out concerning trends in this predictability. The General Hypothesis suggesting trends is as follows.

> General Hypothesis 9: An alternating increasing-decreasing response pattern, with the net effect of an overall increase, will occur concomitant with communication events in the predictability of decision making actions from attitudes, beliefs, other actions and situational factors about the issue.

At the empirical level two trends are suggested in these hypotheses. One is a positive linear increase between the time points. The second is a change in direction of trend occurring with each communication input. Using the research design outlined in Chapter 4, the following empirical hypotheses are offered.

> Empirical Hypotheses 44-46: A positive linear trend will occur through Times 1, 2, 3, 4 and 5 for the predictability of
>
> -adoption of public fallout shelters (Y_6) from attitude, belief, other action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_7, X_9 and X_{10}) (E.H. 44)
>
> -adoption of home fallout shelters (Y_7) from attitude, belief, other action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_6, X_9 and X_{10}) (E.H. 45)

-concurrent adoption of home and public fallout shelters (Y_8) from attitude, belief, other action$_2$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_9 and X_{10}) (E.H. 46).

When applied to the research design, the second trend suggested in the general hypotheses would be a quartic trend, beginning with a decreasing function, since Time 1 was immediately following a communication input. The following empirical hypotheses are offered.

Empirical Hypotheses 47-49: A quartic trend, beginning with a decreasing function, will occur through Times 1, 2, 3, 4 and 5 for the predictability of

-adoption of public fallout shelters (Y_6) from attitude, belief, other action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_7, X_9 and X_{10}) (E.H. 47)

-adoption of home fallout shelters (Y_7) from attitude, belief, other action$_1$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_6, X_9 and X_{10}) (E.H. 48)

-concurrent adoption of home and public fallout shelters (Y_8) from attitude, belief, other action$_2$ and situational variables (X_1, X_2, X_3, X_4, X_5, X_9 and X_{10}) (E.H. 49).

The hypothesized trend in Empirical Hypotheses 47-49 is for an increase in predictability of the adoption variables to occur between Times 2 and 3, and between Times 4 and 5. These are intervals when there were communication inputs. Therefore, it is unnecessary to state direct empirical hypotheses for Working Hypothesis 15 (see p. 26).

Statistical procedures

The statistical procedures used to delineate trend in predictability will be approached from two levels. The first is descriptive and includes plotting the profiles of multiple correlation coefficients at the different points in time for each of the three dependent variables. These data are presented in Figures 5-7. The second procedure is more rigorous in

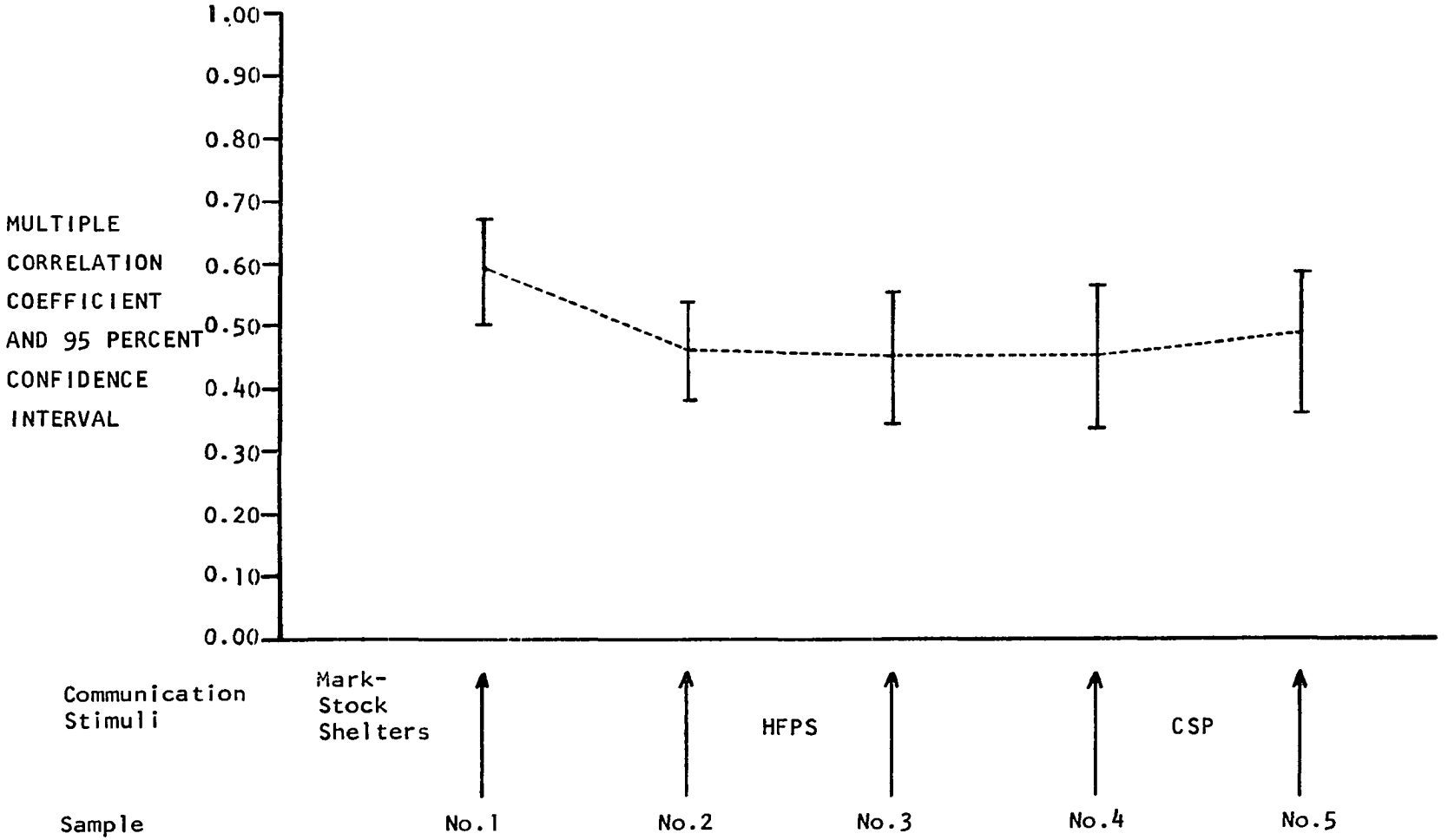

Figure 5. Prediction of adoption of public fallout shelters from eight civil defense and situational variables for Samples 1, 2, 3, 4 and 5 (Empirical Hypotheses 44 and 47)

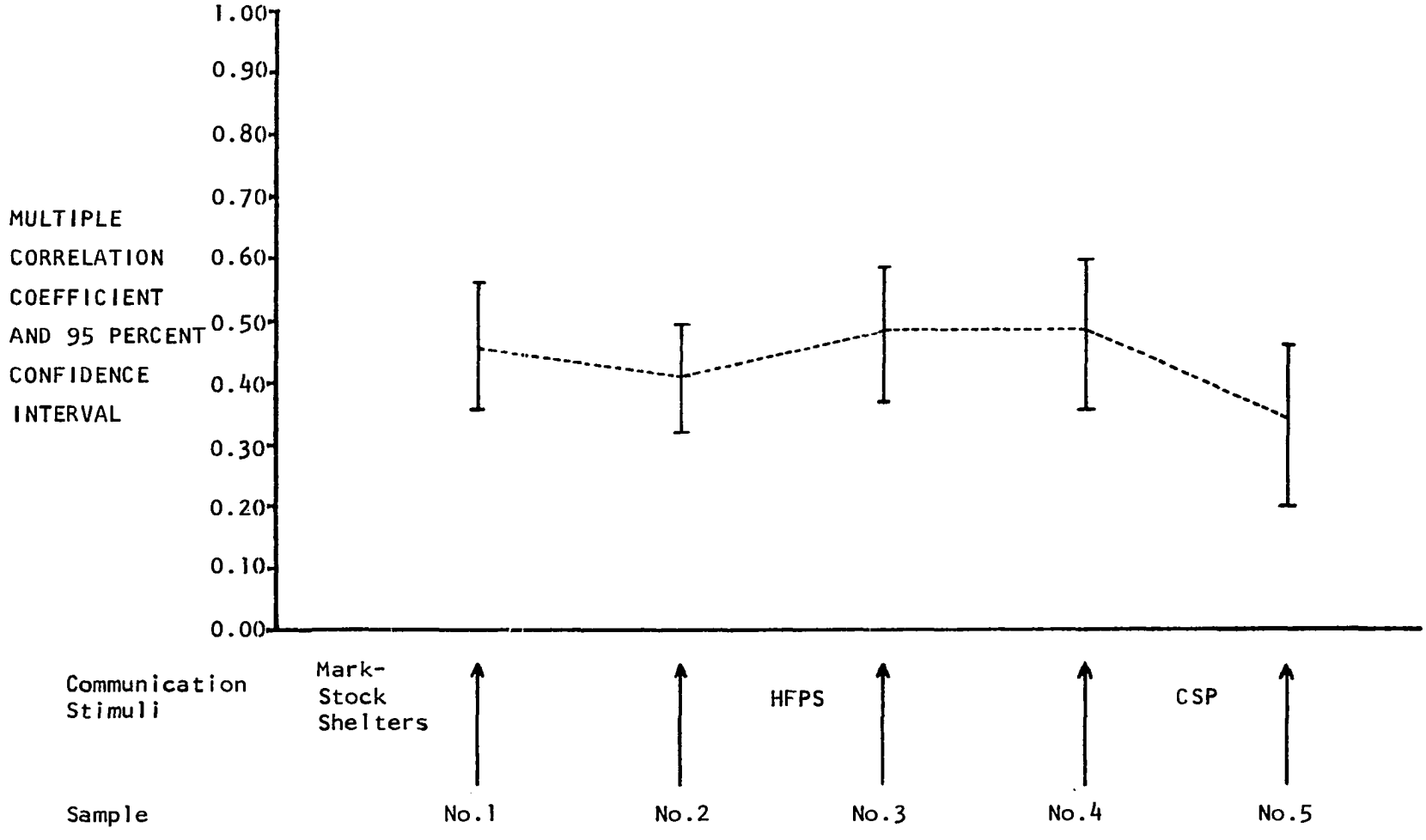

Figure 6. Prediction of home fallout shelters from eight civil defense and situational variables for Samples 1, 2, 3, 4 and 5 (Empirical Hypotheses 45 and 48)

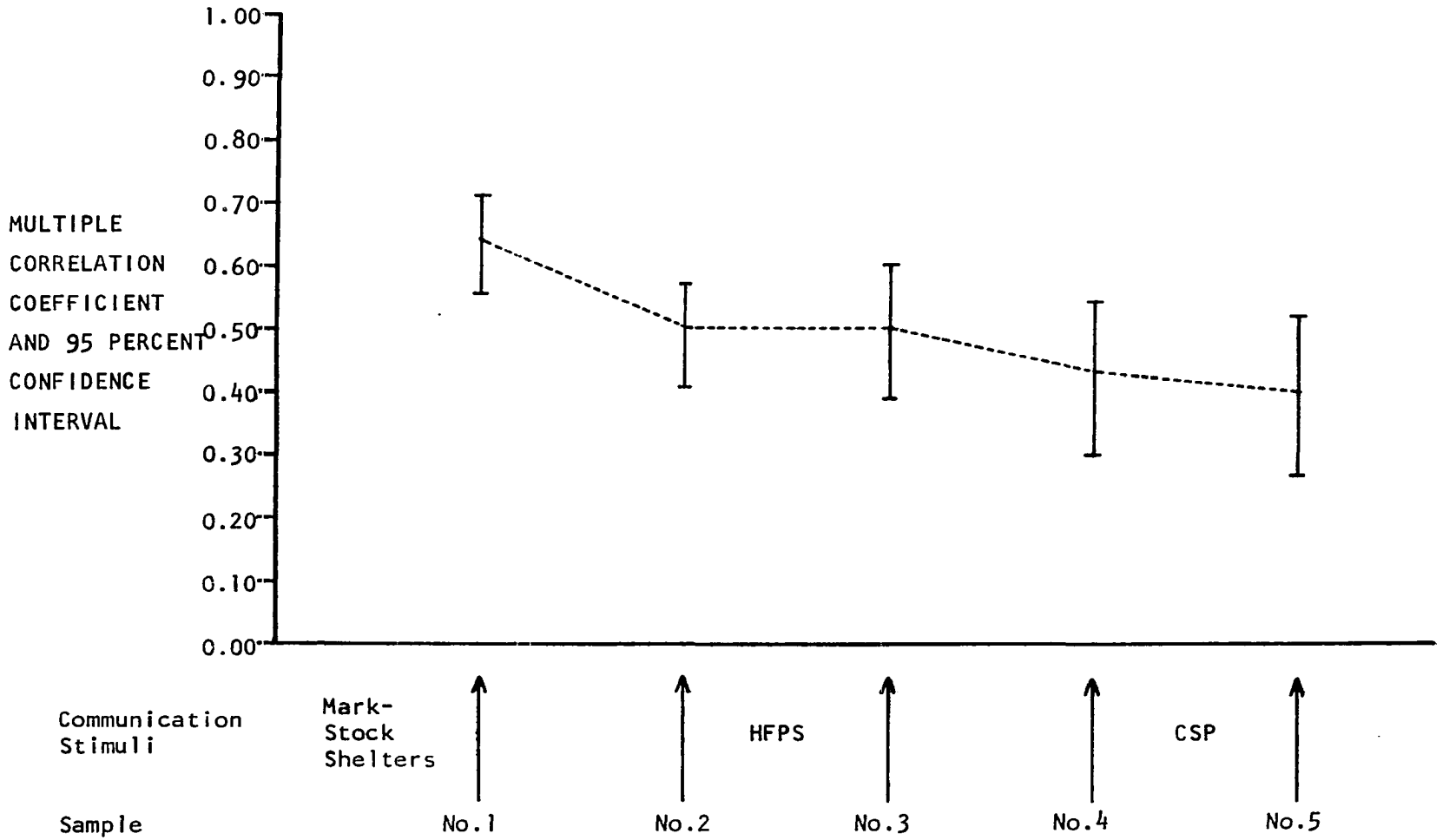

Figure 7. Prediction of concurrent adoption of home and public fallout shelters from seven civil defense and situational variables for Samples 1, 2, 3, 4 and 5 (Empirical Hypotheses 46 and 49)

nature. It includes testing for differences in predictability between all comparisons, two at a time.

The statistical procedure followed in these analyses is a test of equality between coefficients in two relations (Johnston, 64) and tests whether or not the samples taken individually give better explanation than when pooled.

The null statistical hypotheses for this test is

$H_o: \beta_1 = \beta_2 = 0$

where β_1 = the weight of independent variables in finding predicted values of the dependent variables for data set 1

β_2 = the weight of independent variables in finding predicted values of the dependent variables for data set 2

The alternative statistical hypothesis is the betas are not equal.

In the practical application of the test if the calculated F-statistic (Johnston, 64, p. 37) is greater than the tabular F-statistic then the null hypothesis is rejected and the alternative one is accepted. Statistics for the different comparisons are presented in Table 5. Values of the multiple correlation coefficient squared for both the pooled data and the samples taken individually is presented in Appendix D.

Conclusions about empirical hypotheses

Empirical Hypotheses 44 and 47 The observed trend in predicting variable Y_6 - adoption of public fallout shelters did not follow that hypothesized. Neither a linear increase nor a quartic trend was observed. There was, however, a significant decrease in the predictability between Time 1 and each of the remaining time points. No differences were observed for comparisons between Times 2, 3, 4 and 5. Thus, the decay

Table 5. Comparisons between points in time in the predictability of decision making

Comparison	F-STATISTICS Variable Y_6 Public Shelter Adoption	Variable Y_7 Home Shelter Adoption	Variable Y_8 Concurrent Adoption
Time 1 vs. Time 2	4.11**	7.55**	9.53**
Time 1 vs. Time 3	3.94**	0.58	14.14**
Time 1 vs. Time 4	3.96**	1.09	28.87**
Time 1 vs. Time 5	3.72**	12.08**	15.06**
Time 2 vs. Time 3	0.60	17.20**	1.18
Time 2 vs. Time 4	0.42	14.81**	4.24**
Time 2 vs. Time 5	0.72	16.54**	5.01**
Time 3 vs. Time 4	0.60	1.45	2.12*
Time 3 vs. Time 5	0.50	10.21**	6.76**
Time 4 vs. Time 5	0.48	9.80**	1.47

*Significant at .05 level of probability

**Significant at .01 level of probability

observed in predictability of public fallout shelters occurred before 1967. Both Empirical Hypotheses 44 and 47 are rejected.

Empirical Hypotheses 45 and 48 The observed trend in predicting home fallout shelter adoption did not follow that hypothesized. A decrease in the predictability of home fallout shelter adoption from Time 1 to Time 2 was observed, similar to the finding concerning predicting adoption of public fallout shelters. However, unlike public fallout shelter

adoption a rather marked and statistically significant increase occurred during the period when the HFPS program occurred. This program was strongly oriented toward home fallout shelters. However, a decreasing predictability pattern was observed when the Community Shelter Plan information program occurred. This latter message was oriented toward public fallout shelters. Both findings, the increase as well as the decrease in predictability suggests home fallout shelters to be sensitive to communication inputs. Earlier the extent of decision making for home fallout shelters was found to be responsive to communication inputs. However, in the earlier analysis (see pp. 68-69) a positive increase was observed for each message. As was the case for public fallout shelters, the net effect of the messages and time was an overall decrease in predictability. Both Empirical Hypotheses 45 and 48 are rejected.

Empirical Hypotheses 46 and 49 An overall linear decrease, rather than increase, was observed for the predictability of concurrent adoption of home and public fallout shelters. With the exception of the interim between Time 2 and Time 3, when no change was observed, at each successive time point a decrease was observed in the predictability of concurrent adoption of home and public fallout shelters. The interim from Time 2 to Time 3 was when HFPS occurred and a significant increase in predictability was observed for home fallout shelter adoption. Both Empirical Hypotheses 46 and 49 are rejected.

Conclusions for the general hypotheses

The data analyzed in the above section indicate that while decision making behaviors are predictable from other elements in and bearing upon

the conceptual arena of a social issue, for the case of civil defense, communication messages generally do not increase this predictability. For each of the three empirical hypotheses suggesting overall linear increases, the opposite was found. This finding of linear decrease parallels that for consistency among sets of elements. The data strongly suggest the notion that decay may occur when no messages are sent, but does not support the notion that communication messages will reverse and offset the decay.

Summary of Findings

Trends in individual elements

Much of the observed change in variables representing elements in the conceptual arena was not attributable to communication inputs. An exception to this was those representing the action elements. These appeared somewhat sensitive to communication stimuli. The hypothesized decay in elements during periods of no major communication programs generally was not observed. Again, a possible exception was action.

Trends in consistency among elements

An overall finding was one of very low consistency among different groupings of elements in and bearing upon the conceptual arena. Particularly low was the consistency between attitude and belief elements. Except for the case for where these two were considered by themselves, consistency for other groupings generally followed the hypothesized quartic trend, beginning with a decreasing function. Thus, there is some support that communication inputs may stimulate a drive toward consistency.

However, in all cases, a linear decrease, rather than the hypothesized increase, occurred. Because of the overall lack to consistency, these latter findings are tenuous.

Trends in predictability of decision making

Decision making behavior was found to be predictable from other elements in and bearing upon the conceptual arena. However, the trends observed were not those hypothesized. Generally, communication inputs did not result in higher predictability. An overall decrease, rather than increase, was observed in predictability of decision making.

This completes the data analysis and presentation of findings. In the following chapter is further discussion of the findings and implications of the findings for cognitive consistency theory.

Chapter 6

IMPLICATIONS OF FINDINGS

The general hypotheses for this study which were derived from cognitive consistency theories generally were not supported.

Standing out among the findings is the lack of support for hypotheses suggesting consistency among various groupings of elements in and bearing upon the conceptual arena. Generally, sufficient relationships were not observed so that the conclusion of existence of consistency could be drawn. Lowest among the consistency groupings was the one taken directly from the literature--that of attitude and belief consistency. Communication inputs appeared to have no effect upon motivating a drive toward consistency between attitude and beliefs. When the consistency notion was extended to include other elements in and bearing upon the conceptual arena somewhat stronger consistency was observed, but this, too, was of a low level. Nevertheless, for all groupings of elements, except attitude and beliefs by themselves, positive effects of communication inputs were noted in motivating a drive toward consistency.

A second overall finding is decay in the issue studied. Over time both consistency among elements and the predictability of decision making became less. The decaying effects of time intervals when no messages were sent were greater than the hypothesized, though not always observed, increases due to communication inputs.

Earlier civil defense was described as a social issue having low saliency. The findings clearly suggest decay in the conceptual arena of the issue. This may come from the prolonged period of low saliency, or

perhaps from a declining saliency. In either case, messages about the issue may have been given less consideration than if the issue was perceived as having greater importance. Consequently, impact of messages may have been less than would have been the case if the issue were perceived as being more important. Clearly, the messages sent were not sufficient to offset decline in relationships among elements in the conceptual arena.

In this study, the drive toward consistency was based upon the need for individuals to appear rational or consistent to other people as well as to themselves. Because civil defense has low saliency, there may be few cases where consistency is visable to others. Symbolic behavior is not readily apparent, and, since the issue is not often discussed, neither are attitudes or beliefs and knowledge. Thus, the motivation factor of appearing rational may not be strongly operative.

Furthermore, since the issue has low saliency, the social costs of appearing inconsistent about this issue would be small. The conclusion is drawn that if an inconsistent organization of attitudes, beliefs and actions is psychologically uncomfortable, for the case of civil defense, it is not very uncomfortable or at least uncomfortable enough to motivate realignment.

The findings of this investigation are not in agreement with many in the literature. This may be due to the nature of the study. In this investigation data were from a natural setting rather than a laboratory situation. Others have noted discrepancies between these two approaches and attempted to reconcile the differences (Hovland, 59 and Lipset et al.,

73). Usually the effects of the study stimuli are greater in the laboratory setting. For example, Lipset et al. have observed in analyzing political campaign messages that

> ...as long as we test a program in the laboratory we always find that it has great effect on the attitudes and interests of the experimental subject. But when we put the program on as a regular broadcast, we then note that the people who are most influenced in the laboratory tests are those who in a realistic situation, do not listen to the program. The controlled experiment always greatly overrates effects, as compared with those that really occur, because of the self selection of audiences (Lipset et al., 73, p. 1158).

In attempting to reconcile differences such as this, Hovland reasons an important difference is in administration of the study stimulus. In the laboratory experiment all are exposed to the message, but under natural conditions only a limited portion of the audience expose themselves to any given message and this portion of the audience has been found to be biased toward those already favorable toward the content of the message (Hovland, 59).

Another difference suggested by Hovland (59) is that survey methodology generally measures only residual effects of a message whereas the laboratory experiment methodology measures gross effects. The reason for this is because there is a time interval after the communication and before collection of data. In the present investigation, perhaps only the residual effect was measured. Data was collected about one month to six weeks after the HFPS and CSP messages were sent. Nevertheless, if the effects of a stimulus about a social issue having a longevity of several years does decay rapidly, the social significance of the effects of the messages would most likely be in the residual rather than immediate

gross effects. Immediate effects measured in laboratory settings may be impulse reactions rather than an authentic realignment of elements in the conceptual arena.

However, neither of these possibilities account for the general lack of consistency among elements in the conceptual arena. Since decision making was found to be predictable, the evidence is that the issue is at least somewhat organized, although the trend is toward disorganization.

The data presented in this study questions, rather than supports, the notion of consistency as well as the ability of communication stimuli to motivate a drive toward consistency. Even though cognitive consistency theories are supported in many laboratory experiments, if the findings are not replicable in a natural setting their utility in generalizing about social phenomena is considered limited. Further investigation needs to be conducted to determine if there is a general lack of support in a natural setting using not only low salience issues but those having greater perceived importance as well.

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APPENDIX A: LISTS OF QUESTIONS AND STATEMENTS USED TO MEASURE VARIABLES

List A.1. Statements used to measure Variable X_1 - Attitude Toward Fallout Shelters

Statement 1. In general, I am in favor of fallout shelters.

Statement 2. Fallout shelters are like insurance in that you don't know if you'll ever need them, but if you do, they are sure good to have around.

Statement 3. If people around here were in fallout shelters, the chances are good they would survive a nuclear attack.

Statement 4. A thermonuclear war would make living on earth impossible for survivors, so even if fallout shelters were effective, we should forget about them.

Statement 5. The cost of fallout shelters is very little in comparison to the amount of protection they provide.

Statement 6. Since new weapons are constantly being developed fallout shelters will be obsolete too soon to justify their cost.

Statement 7. Fallout shelters make war more likely.

List A.2. Statements and responses to measure Variable X_2 - Perception of Threat

Statement 1. In case of nuclear war, how great a danger do you think there is that the area around here would be a target for bombs or missiles? (No danger, little danger, some danger, great danger, a certain danger)

Statement 2. If there were an attack on the United States with nuclear weapons, what do you really think things would be like around here right after the attack? (No damage or confusion, life normal; little damage, much confusion; damage, most survive; damage, many survivors; destruction but survivors; few survivors; annihilation)

Statement 3. If a nuclear war were to start next week, how good are the chances that people around here would survive? (Very good, fairly good, 50-50, fairly bad, very bad)

Statement 4. If a nuclear war occurs and this area itself is not destroyed, how great a danger do you think there would be from fallout around here? (No danger, little danger, some danger, great danger, a certain danger)

Statement 5. At the present time, how concerned are you about the protection from nuclear fallout? (Have no concern, have almost no concern, have a little concern, have much concern, have very much concern)

List A.3. Statements used to measure Variable X_3 - Knowledge of Local Civil Defense Program

Statement 1. Is there an ongoing civil defense program in Des Moines and Polk County? That is, a program of preparation for nuclear attack, civil defense education, public information, etc.

Statement 2. Does this city (county) have a civil defense director?

Statement 3. What is his name?

List A.4. Statements used to measure X_4 - Knowledge of Technical Aspects of Civil Defense

Statement 1. While a person is being exposed to radiation from fallout, he feels a burning sensation.

Statement 2. If someone has radiation sickness you should avoid getting near him so you won't catch it yourself.

Statement 3. The "protection factor" of a shelter refers to the relationship between the amount of fallout radiation which would be received by a completely unprotected person compared with the amount which would be received by a person in a fallout shelter.

Statement 4. A plastic suit with a filtering mask is plenty of protection against fallout.

Statement 5. If you were in a room lined with aluminum foil, you would be protected from nuclear radiation.

Statement 6. If a door on a fallout shelter is to protect against radiation, it must be airtight.

Statement 7. The more heavy material such as bricks, cement or sand you put between yourself and radioactive fallout, the safer you are from radiation.

Statement 8. Fallout from one bomb may spread over thousands of square miles.

For data collected at Time 1, Statements 3, 5 and 7 were not included. The following statements were substituted.

Statement a. If you get exposed to radiation at all, you are sure to die.

Statement b. You cannot see fallout.

Statement c. After a nuclear attack, if you filter the dust out of the air, the air will be safe to breathe.

List A.5. Information sources and assigned competence levels used to measure X_5 - Use of Competent Sources of Civil Defense Information

Competence Level 1 (1 point for mentioning source)

a. Communication with personal friends, relatives, and neighbors

Assumption: These sources are assumed to be informal person-to-person interactions. They probably do not have a broad scope and depth of civil defense information.

Competence Level 2 (2 points for each source mentioned)

a. TV news and special programs
b. Radio news and special programs
c. Daily or weekly newspapers
d. Magazines
e. Occupation-related sources
f. Meetings conducted by organizations to which you belong

Assumption: These sources are primarily orientated to the general reading or listening public. The frequency and percentage of space and time devoted to civil defense is relatively small compared to sources listed in Competence Levels 3, 4 and 5.

Competence Level 3 (3 points for mentioning source)

a. Publications distributed by the County Extension Office

Assumption: This source has defined civil defense responsibility. However, civil defense is but one of the many functions it is expected to carry out.

Competence Level 4 (4 points for mentioning source)

a. Booklets and pamphlets put out by the Office of Civil Defense

Assumption: The sources were originated by civil defense authorities but they are impersonal sources. The individual cannot ask for clarification of what he does not understand.

Competence Level 5 (5 points for each source mentioned)

a. Meetings conducted by civil defense personnel
b. Visited a fallout shelter

Assumption: These sources are personal sources of information originated by those with civil defense responsibility. There is a large input of civil defense information in these sources and the individual can ask for clarification and ask questions about problems he has.

List A.6. Questions used to index Variable X_6 - Public Fallout Shelter Adoption

Awareness stage questions

Question 1. What does this sign mean to you? (Respondent was shown fallout shelter sign)

Question 2. Have you ever seen or heard about any public fallout shelters around here, this is, in your community, neighborhood or city, that will be available in case of nuclear attack?

Information stage questions

Question 3. Since you first heard about public fallout shelters, have you had any additional information about them?

Question 4. Can you recall any specific buildings which have been selected as public fallout shelters?

Evaluation stage question

Question 5. Have you ever thought at all about using a public fallout shelter in case of nuclear attack?

Decision stage question

Question 6. You have indicated you know about fallout shelters. Which of the following statements best describes your decision about the use of public fallout shelters if a nuclear attack occurs while you are at home with your family?

Have decided not to go to a public fallout shelter
Have considered the possibility but have made no decision about going to a public fallout shelter
Have decided to go to a public fallout shelter
Have never considered using a public fallout shelter

List A.7. Questions used to index Variable X_7 - Home Fallout Shelter Adoption

Relevance of variable

Question 1. Is there a basement in this house (apartment building)?

Awareness stage question

Question 2. Have you heard the suggestion that some home basements might be useful as protection against the effects of nuclear radiation?

Information stage question

Question 3. Have you ever obtained detailed information about the possibility of using your home basement as a fallout shelter?

Evaluation stage question

Question 4. Have you ever thought about using your basement as a fallout shelter in case of nuclear attack?

Decision stage question

Question 6. Which of the following statements best describes your decision about the use of your basement as a fallout shelter if a nuclear attack occurs while you are at home with your family?

Have decided not to go to basement for shelter
Have considered the possibility but have made no decision about going to the basement for shelter
Have never considered the possibility of using the basement as a fallout shelter

APPENDIX B: DISTRIBUTION OF TOTAL SCORES, MEANS AND STANDARD DEVIATIONS FOR VARIABLES USED IN THE INVESTIGATION

Table B.1. Distribution of total scores for attitude toward fallout shelters at five points in time for Samples 1, 2, 3, 4 and 5

Total Attitude Score	Time 1 June 1963 After Mark-Stock % of 246	Time 2 March 1967 Before HFPS % of 435	Time 3 Oct. 1967 After HFPS % of 222	Time 4 Feb. 1969 Before CSP % of 201	Time 5 May 1969 After CSP % of 215
0-16	0.8	1.4	2.3	1.5	0.9
17-32	2.0	1.8	0.9	1.0	0.9
33-48	6.9	3.9	5.0	5.5	1.9
49-64	19.5	9.7	12.6	9.5	11.6
65-80	30.1	20.2	25.2	27.9	23.7
81-96	27.6	33.8	28.8	31.3	40.0
97-112	13.0	29.2	25.2	23.4	20.9
Mean	73.97	83.49	81.05	80.25	82.91
Std. Dev.	19.03	21.31	21.71	20.77	18.15

Table B.2. Distribution of total perception of threat scores for five points in time for Samples 1, 2, 3, 4 and 5

Total Score	Time 1 June 1963 After Mark-Stock % of 246	Time 2 March 1967 Before HFPS % of 435	Time 3 Oct. 1967 After HFPS % of 222	Time 4 Feb. 1969 Before CSP % of 201	Time 5 May 1969 After CSP % of 215
0-3	0.4	0.2	---	---	---
4-6	0.8	1.4	1.4	---	---
7-9	3.7	4.6	1.8	2.0	0.5
10-12	13.4	11.5	12.2	11.4	1.6
13-15	19.5	25.5	22.5	25.4	22.8
16-18	31.7	29.9	30.2	24.9	30.2
19-21	15.4	18.2	20.3	19.9	29.3
22-24	10.6	6.4	7.7	12.9	8.8
25-27	3.7	2.1	3.6	3.5	1.9
28-30	0.8	0.2	0.5	---	---
Mean	16.64	16.07	16.86	17.01	17.45
Std. Dev.	4.44	4.10	4.23	4.00	3.41

Table B.3. Distribution of total scores for knowledge of local civil defense program at five points in time for Samples 1, 2, 3, 4 and 5

Total Score	June 1963 After Mark-Stock % of 246	March 1967 Before HFPS % of 435	Oct. 1967 After HFPS % of 222	Feb. 1969 Before CSP % of 201	May 1969 After CSP % of 215
0	23.2	34.3	46.4	37.3	29.8
1	18.3	12.4	17.1	19.9	17.7
2	55.7	51.3	36.0	42.3	51.2
3	2.8	2.1	0.5	0.5	1.4
Mean	1.38	1.21	0.91	1.06	1.24
Std. Dev.	0.87	0.95	0.91	0.90	0.90

Table B.4. Distribution of total scores for knowledge of technical aspects of civil defense at five points in time for Samples 1, 2, 3, 4 and 5

Total Score	June 1963 After Mark-Stock % of 246	March 1967 Before HFPS % of 435	Oct. 1967 After HFPS % of 222	Feb. 1969 Before CSP % of 201	May 1969 After CSP % of 215
0	2.4	1.4	2.7	3.5	0.5
1	6.5	3.7	5.0	4.0	3.7
2	25.2	10.8	14.0	11.4	11.6
3	17.1	12.4	14.4	15.4	15.8
4	22.0	21.6	18.9	15.4	20.9
5	17.1	16.3	23.4	19.9	16.7
6	6.8	16.1	8.6	18.9	16.3
7	2.4	14.3	8.6	8.5	9.3
8	0.4	3.4	4.5	3.0	5.1
Mean	3.43	4.54	4.16	4.31	4.46
Std. Dev.	1.60	1.86	1.91	1.91	1.82

Table B.5. Distribution of total scores for use of competent sources of civil defense information at five points in time for Samples 1, 2, 3, 4 and 5

Total Score	June 1963 After Mark-Stock % of 246	March 1967 Before HFPS % of 435	Oct. 1967 After HFPS % of 222	Feb. 1969 Before CSP % of 201	May 1969 After CSP % of 215
0-3	40.7	12.9	11.3	15.9	10.2
4-6	40.7	26.2	21.6	26.9	25.6
7-9	10.6	23.0	19.4	18.4	20.0
10-12	5.7	13.3	19.4	16.4	23.7
13-15	2.4	8.7	12.2	7.0	10.7
16-18	---	8.0	6.3	7.0	4.2
19-21	---	2.5	5.0	5.5	3.3
22-24	---	2.5	2.7	1.0	1.4
25-27	---	1.6	2.3	2.0	0.9
28-30	---	1.1	---	---	---
Mean	4.08	9.20	9.97	8.67	9.02
Std. Dev.	3.64	6.15	5.97	6.09	5.21

Table B.6. Distribution of stage of adoption of public fallout shelters at five points in time for Samples 1, 2, 3, 4 and 5

Total Score	Time 1 June 1963 After Mark-Stock % of 246	Time 2 March 1967 Before HFPS % of 435	Time 3 Oct. 1967 After HFPS % of 222	Time 4 Feb. 1969 Before CSP % of 201	Time 5 May 1969 After CSP % of 215
1 = Unaware	13.4	12.0	15.8	12.4	7.9
2 = Aware	12.6	13.1	12.6	10.4	9.8
3 = Information	33.3	30.1	25.2	37.3	33.5
4 = Evaluation	9.3	20.7	18.5	21.9	26.5
5 = Rejection	3.7	2.8	4.5	1.5	2.3
6 = Adoption	27.6	21.4	23.4	16.4	20.0
Mean	3.35	3.53	3.54	3.39	3.63
Std. Dev.	1.89	1.61	1.72	1.49	1.47

Table B.7. Distribution of stage of adoption of home fallout shelters at five points in time for Samples 1, 2, 3, 4 and 5

	Time 1 June 1963	Time 2 March 1967	Time 3 Oct. 1967	Time 4 Feb. 1969	Time 5 May 1969
	After Mark-Stock	Before HFPS	After HFPS	Before CSP	After CSP
	% of 246	% of 378	% of 201	% of 182	% of 188
1 = Unaware	8.5	20.4	14.4	11.5	11.2
2 = Aware	53.3	66.7	29.4	32.4	18.1
3 = Information	3.7	0.3	12.4	10.4	19.7
4 = Evaluation	4.1	4.2	13.4	22.5	23.4
5 = Rejection	13.4	1.0	3.0	2.7	4.3
6 = Adoption	17.1	7.1	27.4	20.3	23.4
Mean	3.12	2.21	3.43	3.33	3.62
Std. Dev.	1.73	1.60	1.85	1.69	1.66

Table B.8. Distribution of concurrent stage of adoption of home and public fallout shelters at five points in time for Samples 1, 2, 3, 4 and 5

Concurrent Adoption Stage	June 1963 After Mark-Stock % of 246	March 1967 Before HFPS % of 378	Oct. 1967 After HFPS % of 201	Feb. 1969 Before CSP % of 182	May 1969 After CSP % of 188
1 = Una-Una	5.3	5.6	5.5	2.7	1.6
2 = Una-Aw	15.0	10.3	8.5	9.3	4.8
3 = Aw-Aw	5.3	9.3	4.5	4.4	3.2
4 = Una-Dec	3.3	7.9	10.0	5.5	6.9
5 = Aw-Dec	19.5	36.2	11.9	19.2	12.8
6 = Dec-Dec	3.3	3.4	13.4	23.1	29.8
7 = Rej-Una	2.0	---	---	---	---
8 = Rej-Aw	2.4	2.1	---	0.5	---
9 = Rej-Dec	4.5	0.3	1.5	---	2.7
10 = Rej-Rej	0.4	---	---	0.5	---
11 = Adopt Either	39.0	24.9	44.8	34.6	38.3
Mean	6.89	5.80	7.25	6.82	7.36
Std. Dev.	3.76	3.30	3.68	3.34	3.14

Table B.9. Distribution of education categories for Samples 1, 2, 3, 4 and 5

Education Categories	Time 1 June 1963 After Mark-Stock % of 246	Time 2 March 1967 Before HFPS % of 435	Time 3 Oct. 1967 After HFPS % of 222	Time 4 Feb. 1969 Before CSP % of 201	Time 5 May 1969 After CSP % of 215
8th grade or less	11.8	11.7	14.9	12.4	7.4
Some high school	10.6	12.2	14.4	18.4	15.8
High school graduate	38.6	39.5	37.4	38.8	42.8
Some college	23.6	21.4	17.6	19.4	18.5
College graduate	15.5	15.2	15.8	10.9	15.4
Mean	12.49	12.37	12.13	12.36	12.44
Std. Dev.	2.72	2.83	3.14	2.58	2.54

Table B.10. Distribution of age categories for Samples 1, 2, 3, 4 and 5

Age Categories	Time 1 June 1963 After Mark-Stock % of 246	Time 2 March 1967 Before HFPS % of 435	Time 3 Oct. 1967 After HFPS % of 222	Time 4 Feb. 1969 Before CSP % of 201	Time 5 May 1969 After CSP % of 215
24 or less	8.1	8.0	11.3	5.0	8.8
25-34	23.6	18.9	18.0	18.4	21.9
35-44	24.0	23.0	19.8	24.4	24.2
45-54	16.7	19.1	19.4	17.9	18.1
55-64	19.1	17.0	14.0	13.4	15.8
65+	8.5	14.0	17.6	20.9	11.2
Mean	43.30	46.32	45.95	48.76	44.42
Std. Dev.	14.76	15.62	16.52	17.72	15.57

APPENDIX C: INTER-ITEM CORRELATION MATRICES FOR SAMPLES 1, 2, 3, 4 AND 5 AND FOR THE SAMPLES POOLED

Table C.1. Inter-item correlation coefficients among 10 civil defense situational variables for Sample I

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1 - Attitude Toward Fallout Shelters	---									
X_2 - Perception of Threat	.05	---								
X_3 - Local Civil Defense Knowledge	.29	-.16	---							
X_4 - Technical Civil Defense Knowledge	.18	-.03	.37	---						
X_5 - Use of Competent Information	.24	-.01	.38	.27	---					
X_6 - Public Fallout Shelter Adoption	.30	-.04	.36	.27	.54	---				
X_7 - Home Fallout Shelter Adoption	.22	-.02	.33	.38	.29	.25	---			
X_8 - Concurrent Adoption	.30	-.06	.46	.36	.55	.74	.67	---		
X_9 - Education	.20	-.12	.35	.36	.37	.22	.25	.31	---	
X_{10} - Age	.25	.06	.16	.09	.12	.12	.13	.06	.11	---

Table C.2. Inter-item correlation coefficients among 10 civil defense situational variables for Sample 2

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1 - Attitude Toward Fallout Shelters	---									
X_2 - Perception of Threat	.22	---								
X_3 - Local Civil Defense Knowledge	.12	.04	---							
X_4 - Technical Civil Defense Knowledge	.06	.06	.19	---						
X_5 - Use of Competent Information	.17	.06	.24	.27	---					
X_6 - Public Fallout Shelter Adoption	.27	.13	.21	.26	.34	---				
X_7 - Home Fallout Shelter Adoption	.05	.00	.15	.22	.27	.14	---			
X_8 - Concurrent Adoption	.18	.09	.16	.27	.32	.64	.65	---		
X_9 - Education	-.07	-.01	.16	.35	.39	.16	.22	.22	---	
X_{10} - Age	.15	.09	.09	.34	.13	.17	.03	.06	.20	---

Table C.3. Inter-item correlation coefficients among 10 civil defense situational variables for Sample 3

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1 - Attitude Toward Fallout Shelters	---									
X_2 - Perception of Threat	.18	---								
X_3 - Local Civil Defense Knowledge	.06	.01	---							
X_4 - Technical Civil Defense Knowledge	.06	.01	.33	---						
X_5 - Use of Competent Information	.12	.18	.33	.41	---					
X_6 - Public Fallout Shelter Adoption	.16	.12	.27	.36	.31	---				
X_7 - Home Fallout Shelter Adoption	.05	.07	.27	.32	.22	.14	---			
X_8 - Concurrent Adoption	.10	.12	.28	.30	.25	.53	.79	---		
X_9 - Education	-.02	.06	.36	.46	.37	.18	.25	.23	---	
X_{10} - Age	.15	.02	.07	.26	.27	.19	-.05	-.02	.29	---

Table C.4. Inter-item correlation coefficients among 10 civil defense situational variables for Sample 4

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1 - Attitude Toward Fallout Shelters	---									
X_2 - Perception of Threat	.02	---								
X_3 - Local Civil Defense Knowledge	.15	-.02	---							
X_4 - Technical Civil Defense Knowledge	.07	.03	.23	---						
X_5 - Use of Competent Information	.08	.05	.26	.39	---					
X_6 - Public Fallout Shelter Adoption	.16	.06	.22	.30	.33	---				
X_7 - Home Fallout Shelter Adoption	-.01	.08	.08	.27	.34	.14	---			
X_8 - Concurrent Adoption	.01	.06	.05	.23	.29	.56	.78	---		
X_9 - Education	-.07	-.11	.15	-.02	.04	.07	.08	.09	---	
X_{10} - Age	.06	.05	.06	.45	.18	.28	.08	.15	-.02	---

Table C.5. Inter-item correlation coefficients among 10 civil defense situational variables for Sample 5

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1 - Attitude Toward Fallout Shelters	---									
X_2 - Perception of Threat	.04	---								
X_3 - Local Civil Defense Knowledge	.08	.06	---							
X_4 - Technical Civil Defense Knowledge	-.11	.01	.26	---						
X_5 - Use of Competent Information	-.09	.05	.32	.30	---					
X_6 - Public Fallout Shelter Adoption	.10	.14	.37	.26	.27	---				
X_7 - Home Fallout Shelter Adoption	-.04	.08	.23	.28	.23	.18	---			
X_8 - Concurrent Adoption	.01	.12	.30	.32	.23	.47	.85	---		
X_9 - Education	-.24	-.07	.30	.44	.29	.16	.18	.16	---	
X_{10} - Age	.02	.02	.13	.38	.09	.24	.04	.09	-.07	---

Table C.6. Inter-item correlation coefficients among 10 civil defense situational variables for pooled Samples 1, 2, 3, 4 and 5, N = 1319

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1 - Attitude Toward Fallout Shelters	---									
X_2 - Perception of Threat	.12	---								
X_3 - Local Civil Defense Knowledge	.12	-.01	---							
X_4 - Technical Civil Defense Knowledge	.09	.02	.24	---						
X_5 - Use of Competent Information	.16	.06	.22	.36	---					
X_6 - Public Fallout Shelter Adoption	.21	.09	.27	.27	.32	---				
X_7 - Home Fallout Shelter Adoption	.02	.06	.19	.23	.20	.16	---			
X_8 - Concurrent Adoption	.11	.08	.23	.25	.25	.59	.75	---		
X_9 - Education	-.04	-.05	.22	.24	.22	.14	.15	.17	---	
X_{10} - Age	-.04	.03	.14	.06	-.15	.14	.09	.12	.11	---

APPENDIX D: PREDICTION OF DECISION MAKING FOR SAMPLES 1, 2, 3, 4 AND 5 AND FOR COMBINATIONS OF POOLING SAMPLES

Table D.1. Prediction of decision making behaviors from eight civil defense and situational variables for Samples 1, 2, 3, 4 and 5[a]

Samples	MULTIPLE CORRELATION COEFFICIENT SQUARED		
	Variable Y_6 Public Shelter Adoption	Variable Y_7 Home Shelter Adoption	Variable Y_8 Concurrent Adoption
Sample 1	.348	.230	.410
Sample 2	.212	.168	.212
Sample 3	.202	.230	.202
Sample 4	.202	.230	.202
Sample 5	.230	.116	.230

[a]Concurrent adoption predicted from seven rather than eight variables

Table D.2. Prediction of decision making behaviors from eight civil defense and situational variables from pooled data sets[a]

Pooled Samples	MULTIPLE CORRELATION COEFFICIENT SQUARED		
	Variable Y_6 Public Shelter Adoption	Variable Y_7 Home Shelter Adoption	Variable Y_8 Concurrent Adoption
Sample 1 + Sample 2	.230	.194	.270
Sample 1 + Sample 3	.230	.230	.292
Sample 1 + Sample 4	.240	.212	.260
Sample 1 + Sample 5	.250	.176	.270
Sample 2 + Sample 3	.202	.137	.221
Sample 2 + Sample 4	.202	.144	.202
Sample 2 + Sample 5	.194	.130	.212
Sample 3 + Sample 4	.194	.212	.194
Sample 3 + Sample 5	.202	.168	.194
Sample 4 + Sample 5	.212	.160	.152

[a]Concurrent adoption predicted from seven rather than eight variables